Chemical Week

April 20, 1957

Price 35 cents





How do you pay your salesmen? CW Report author surveys payment plans, forecasts trend . p. 79

Canadian profit margins dropped, but chemical firms averaged better than their U.S. cousins . . . p. 31

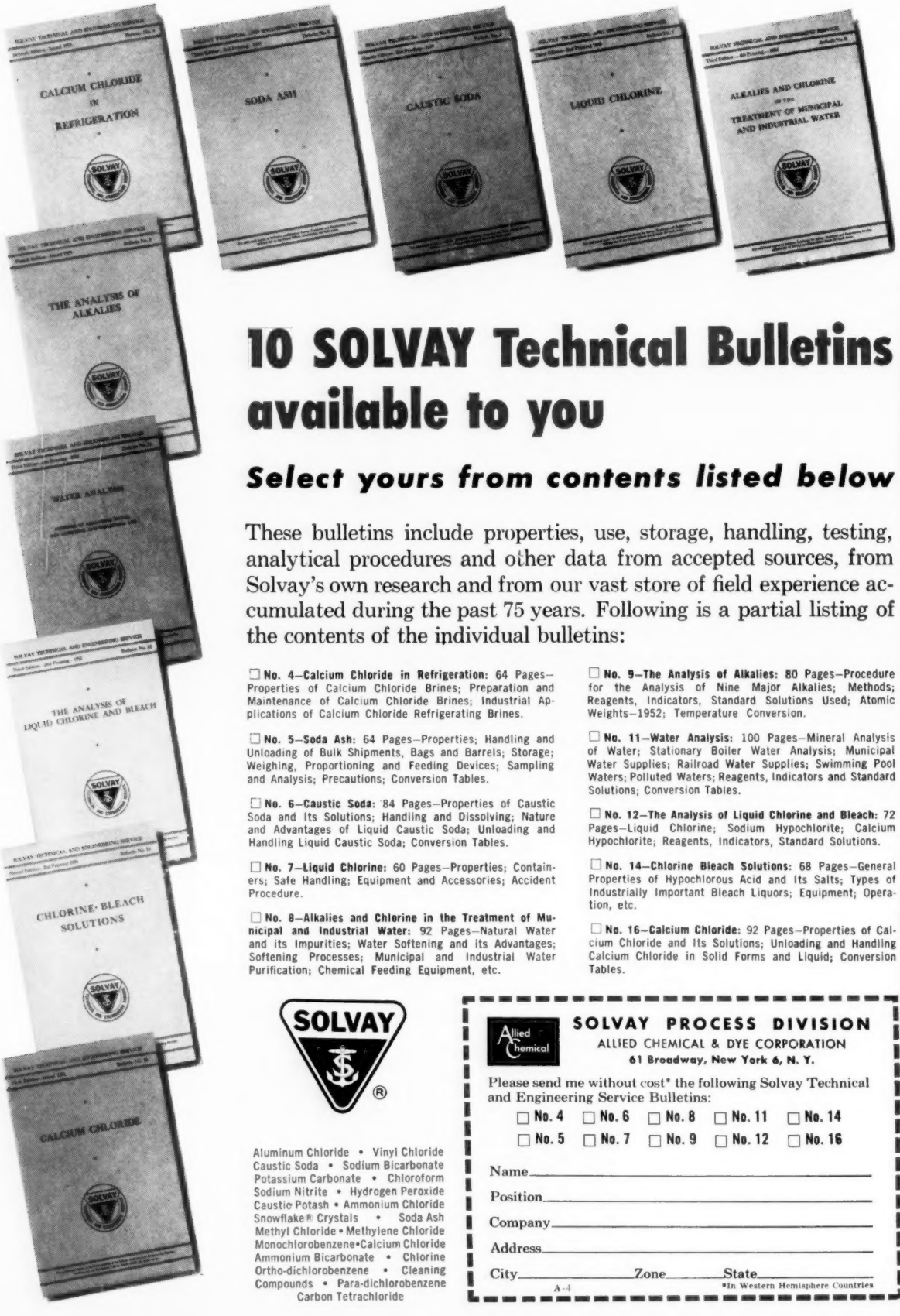
Burgettstown learns about chemicals as Progress Week emissary visits his old home town . . p. 36

Louisville looks for new industry, hopes to regain its place as chemical production center . p. 99

Keep your researchers happy— that's this smaller firm's recipe for upping productivity . . . . p. 138

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A-4

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Here's how the management of a multi-million dollar corporation used its knowledge of chemical cleaning to start a new plant off in the right way—in the black.

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The total cost of this mill scaling was approximately $5,000. But, once in production, this plant did not have a single major shut down for maintenance caused by mill scale. The plant management credits Dowell Service with netting the plant an operating profit somewhere between 10 and 20 times the cost of the chemical cleaning. This amounted to between $50,000 and $100,000 the first year.

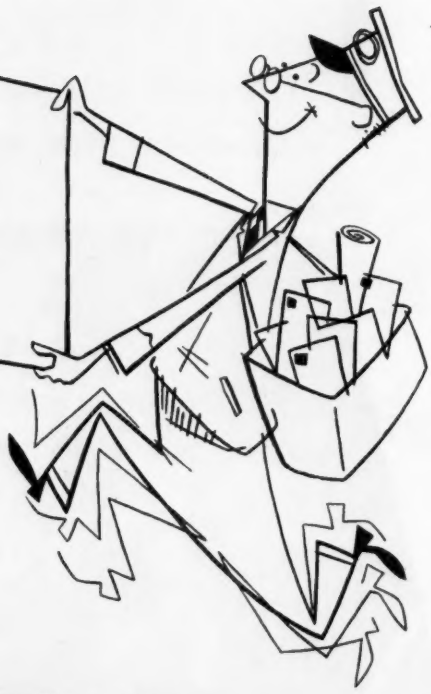
This particular case history is about a chemical company, but Dowell has startling performance data to show you—from your own industry. That's because chemical cleaning is so versatile. Dowell engineers are experts in removing scale and sludge from process systems, tanks and piping. They apply solvents in various ways—such as filling, jetting, cascading. Dowell furnishes all the necessary chemicals, trained personnel, pumping and control equipment.

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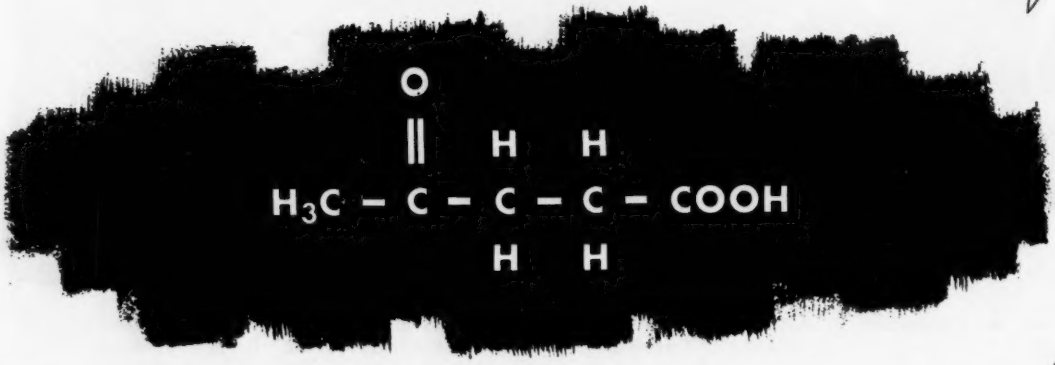
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Chemical Week

TOP OF THE WEEK

April 20, 1957

- **Federal budget-cutting affects chemically important agencies.** Here's who's being cut how much .....p. 34
- **Sisal is new commercial source of steroid hormones,** as Mexican firm gears up new extraction process .....p. 41
- **Two new miticides are going commercial,** as ICI's Tetram and Hercules' Navadel make their bows .....p. 60
- **Shoe polishes are an $80-85-million/year business.** CW rounds up the trends in this booming industry .....p. 66
- **Noncellulosic synthetic fiber capacity is growing,** will soon hit 800 million lbs./year .....p. 126

17 BUSINESS NEWSLETTER

28 OPINION

28 MEETINGS

31 BUSINESS NEWS

Canadian chemical firms, though also under profit pressures, generally did somewhat better than U.S. firms in '56.

32 Interhandel's appeal to stay sale of General Aniline & Film is denied.

32 Metal & Thermit's management was re-elected, as insurgent stockholder group lost out.

32 British economic belt-tightening includes proposed control of drug prices by government.

33 Ten years after the Texas City explosion: controversy over damage payments still continues.

36 Chemical Progress Week celebrations were local events; here's what happened in Burgettstown, Pa.

41 PRODUCTION

57 WASHINGTON NEWSLETTER

58 CHARTING BUSINESS

60 SPECIALTIES

62 'Fair trade' price maintenance laws aren't dead by any means.

79 CW REPORT

Compensation plans for salesmen are varied in structure and scope, but these are the trends.

95 TECHNOLOGY NEWSLETTER

99 ADMINISTRATION

Louisville, Ky., looks for ways to recover its past vogue as a chemical production center.

104 Need extra office help on a short-order basis? Service firms are helping companies with temporary clerical personnel.

113 SALES

National packaging exposition features raft of new material ideas.

116 Mail-order technical service gets a tryout at Carborundum.

118 Detachable trailers make wheelless piggybacking possible.

120 Here's one view of how European common market will affect U.S. chemical producers.

126 MARKETS

135 MARKET NEWSLETTER

138 RESEARCH

Smaller firm's utilization of scientific manpower cuts turnover, ups patent productivity.

148 New electro-optic device based on birefringence theory may be used to provide quick clues to molecular structure.

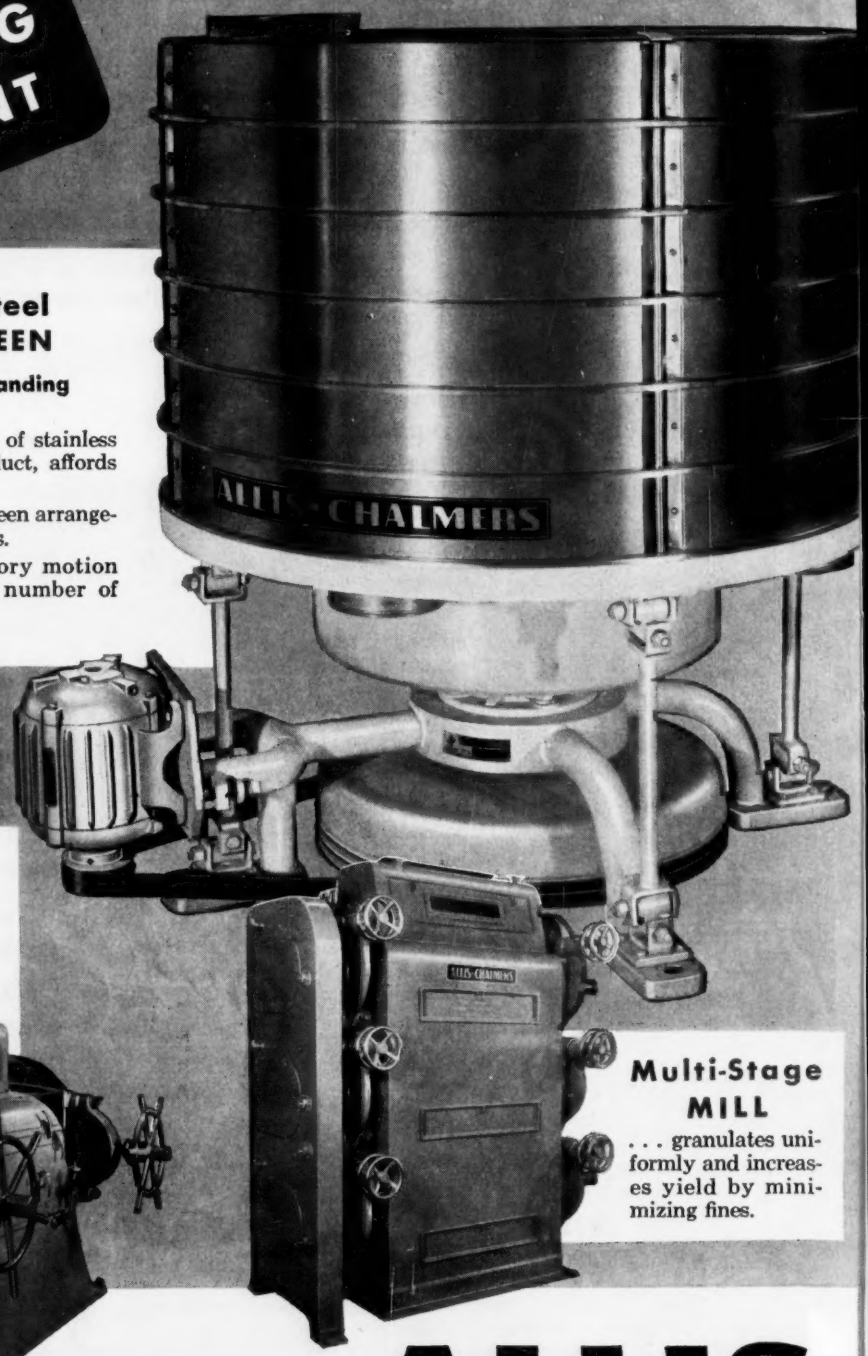
151 These industrially significant developments were reported at the 131st ACS national meeting.

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No. 16

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"Coordineered" to

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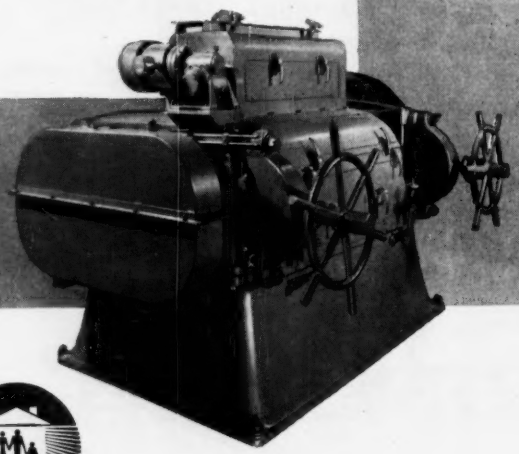
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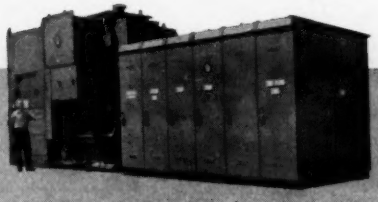
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- Allis-Chalmers maintains complete laboratory and pilot-plant facilities.
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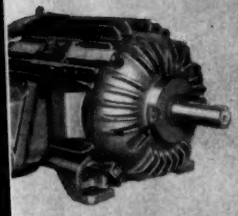
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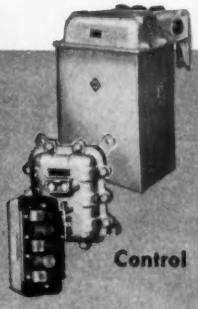
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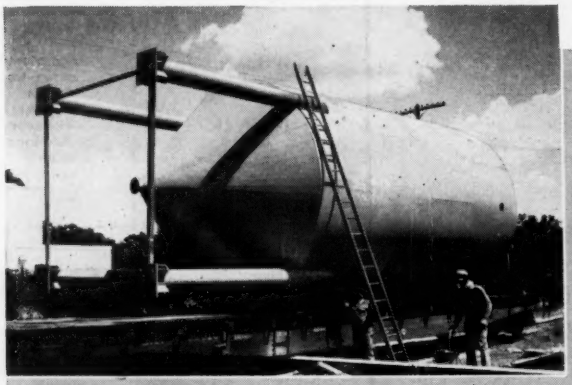
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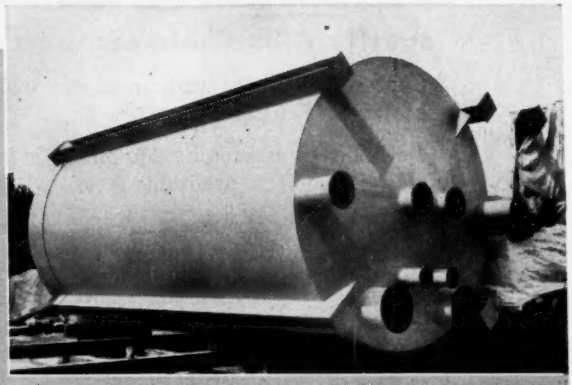
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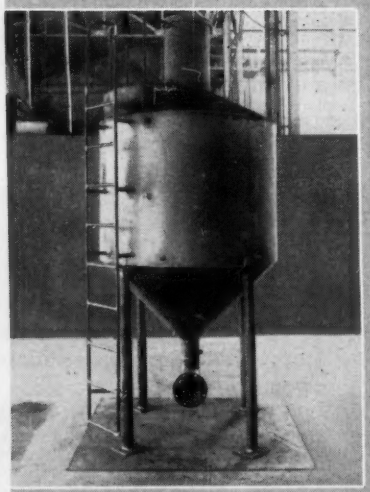
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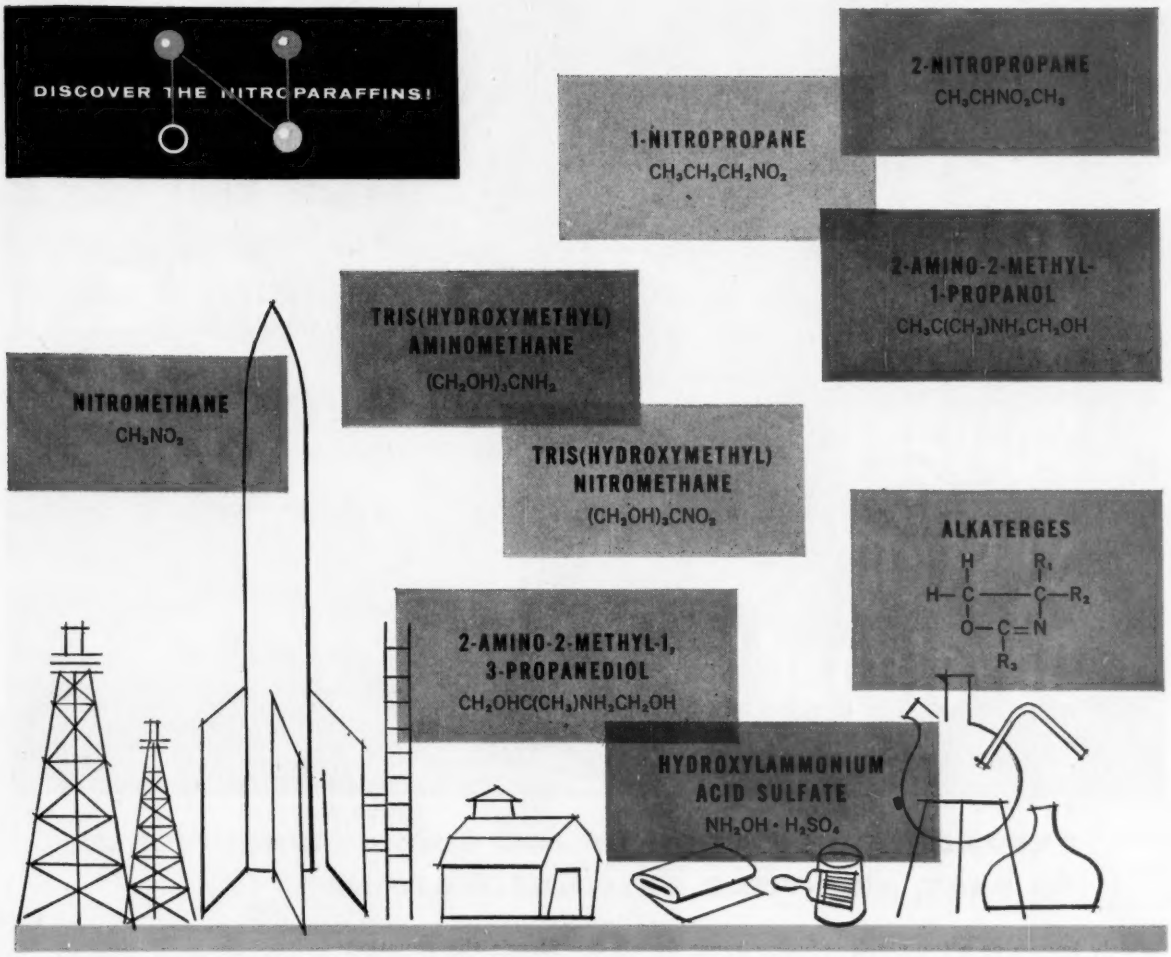
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Another example of interest is ethyl stearate reduced to stearyl alcohol. The reduction works out like this:

$$2CH_3(CH_2)_{16}\overset{\overset{O}{\|}}{C}\text{-}OCH_2CH_3 + NaBH_4 + \tfrac{1}{3}AlCl_3 \xrightarrow{\text{diglyme}}$$

$$2CH_3(CH_2)_{16}CHOH\text{-}CH_3 + 2CH_3CH_2OH$$

Easy to use, sodium borohydride is stable in dry air to 300°C. A white crystalline solid, it decomposes in vacuum at 400°C. Typical assay is 98.0%.

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* Journal of the American Chemical Society, 77, 3164 (1955) Herbert C. Brown B. C. Subba Rao

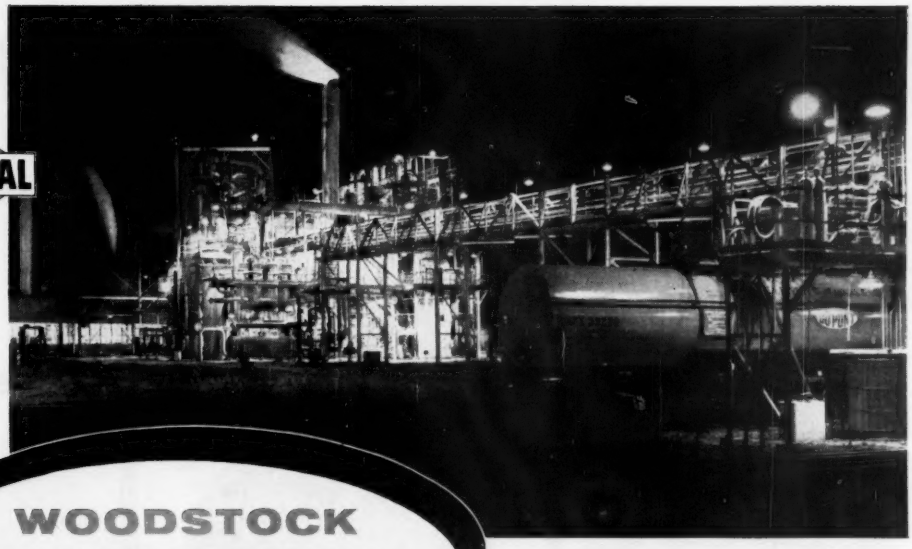
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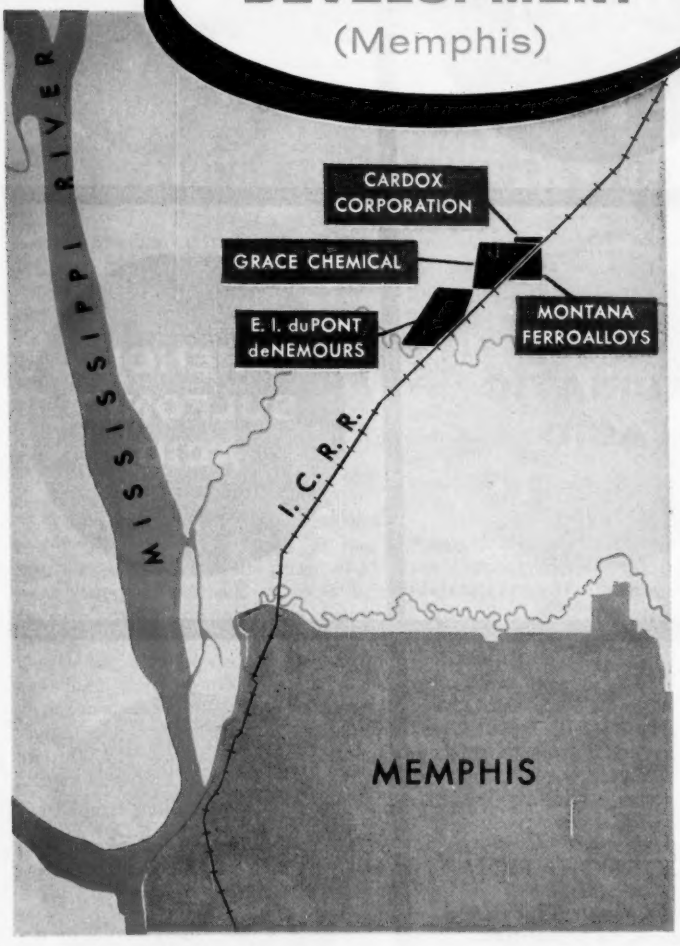
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Keeping volatile insecticides working much longer is a growing job for

Aroclor 5460:
MAKING NEW SPECIALTY MARKETS FOR INSECTICIDES

A smart formulating trick that has laid dormant on the shelf for three years now promises some profitable specialties. The opportunities first came to light when U. S. Department of Agriculture scientists reported that chlorinated polyphenyls lengthened the kill-life of volatile insecticides (CW Aug. 14, 1954). Since then, commercial researchers have been nibbling into the enormous possibilities. To date little has been published on the commercial exploitation in specific applications. Most research has been along broad "screening" lines, such as the resin's effect on the staying power of a wide variety of pesticide compounds, and spot checking on conditions of use.

Despite the fact that most of the results have been highly promising, apparently no commercial formulator has yet seized on non-crop uses—which offer the most logically and immediately profitable applications.

As an example, under research conditions it was shown that a sprayed-on mixture of 25% lindane, 25% Aroclor 5460, and 50% solvent enabled the treated surface to kill house flies for a period of 102 days . . . *ten times longer* than the same dosage without Aroclor! On cockroaches, a lindane-Aroclor mixture, used at the rate of 50 mg. lindane per square foot under experimental conditions, still registered an 80% kill after 60 days. Straight lindane solution, same rate, same conditions, scored only a 4% kill.

Enterprising specialty marketers are just becoming aware of the possibilities. For improved fly killers alone, there is an enormous market: Count up dairy barns, soft drink bottling plants, commercial dairies, and packing houses where flies are anathema. A twice-a-season spray of walls, ceilings, and out-of-the-way surfaces could contribute enormously to fly control.

Specialty consumer products offer still other possibilities. Local pest-control programs are on the upswing. It has been proved that, with concerted effort, a community can vastly cut down, if not practically free itself from, rat and mosquito populations. Just how far local, community-wide *fly-control* programs can be stimulated by progressive insecticide formulators is anybody's guess. But a juicy specialty market might be developed with simply a 6-oz. dauber bottle of lindane-Aroclor concentrate for painting the underside and rims of garbage can lids. Repelling or killing the flies would automatically control maggot breeding. Door and window screen sprays and shrub sprays are another possibility. A lindane-Aroclor aerosol sprayed on a willow tree continued to kill flies after two months of outdoor exposure, with no apparent injury to the foliage. How safe the "bonded on" insecticides are to shrubs, however, awaits investigation. But thousands of suburban householders would welcome a control agent for spider mites that breed in foundation plantings.

Possibilities for profitable applications are enormous for formulators who will undertake the necessary development. Aroclor 5460 resin imparts "staying power" to a number of chlorinated insecticides, including heptachlor, chlordane, and aldrin. As a "bonding" agent for insecticides, Aroclor 5460 is low in cost. The transparent, yellow resin is soluble in a variety of solvents. Further, Aroclor 5460 bonds tightly to metal; is easy to handle and formulate. It is relatively nonvolatile, nonflammable, nonoxidizable; shows no primary skin irritancy or sensitization. For particular uses, such as insect traps or tapes, other Aroclors (Monsanto produces seven) might be substituted: Aroclor 4465, for example, gives a very tacky surface; Aroclor 1254 provides a "wet" surface; etc. All are chlorinated terphenyls with interesting variations in physical properties.

Aroclor: Reg. U. S. Pat. Off.

For further information, write on your company letterhead requesting a copy of: Specialty Data Report S-6, *Aroclors for Insecticide Formulation.* Monsanto Chemical Company, Department CS-6, Organic Chemicals Division, St. Louis 1, Missouri.



For Blanketing Fire in Chemicals, Gasoline, Oils

These pictures were taken at Robins Air Force Base in Georgia during acceptance tests of a Grinnell ProtectoFoam System. Above, a man slogs through foam to check the spray pattern produced by over 800 nozzles discharging 75,000 gallons of foam per minute.

With a ProtectoFoam system, a vapor tight blanket of foam floats on liquids and clings to solids, extinguishing flames and preventing re-ignition. It is particularly effective against fires in gasoline, oils, and chemicals.

The foam, a harmless mixture of water and a protein base foaming agent, is produced mechanically by special Grinnell nozzles. When the foam compound has been used up or shut off, these nozzles then discharge water in the same manner as standard open sprinklers. Once the fire is out, the water discharge may be used to wash down the building and equipment and clean away the foam.

ProtectoFoam is only one of many Grinnell Fire Protection Systems designed for special hazard application. For unbiased advice on your fire protection problems, write to Grinnell Company, Inc., 288 West Exchange Street, Providence, Rhode Island.



Foam flows under aircraft to form a complete blanket.



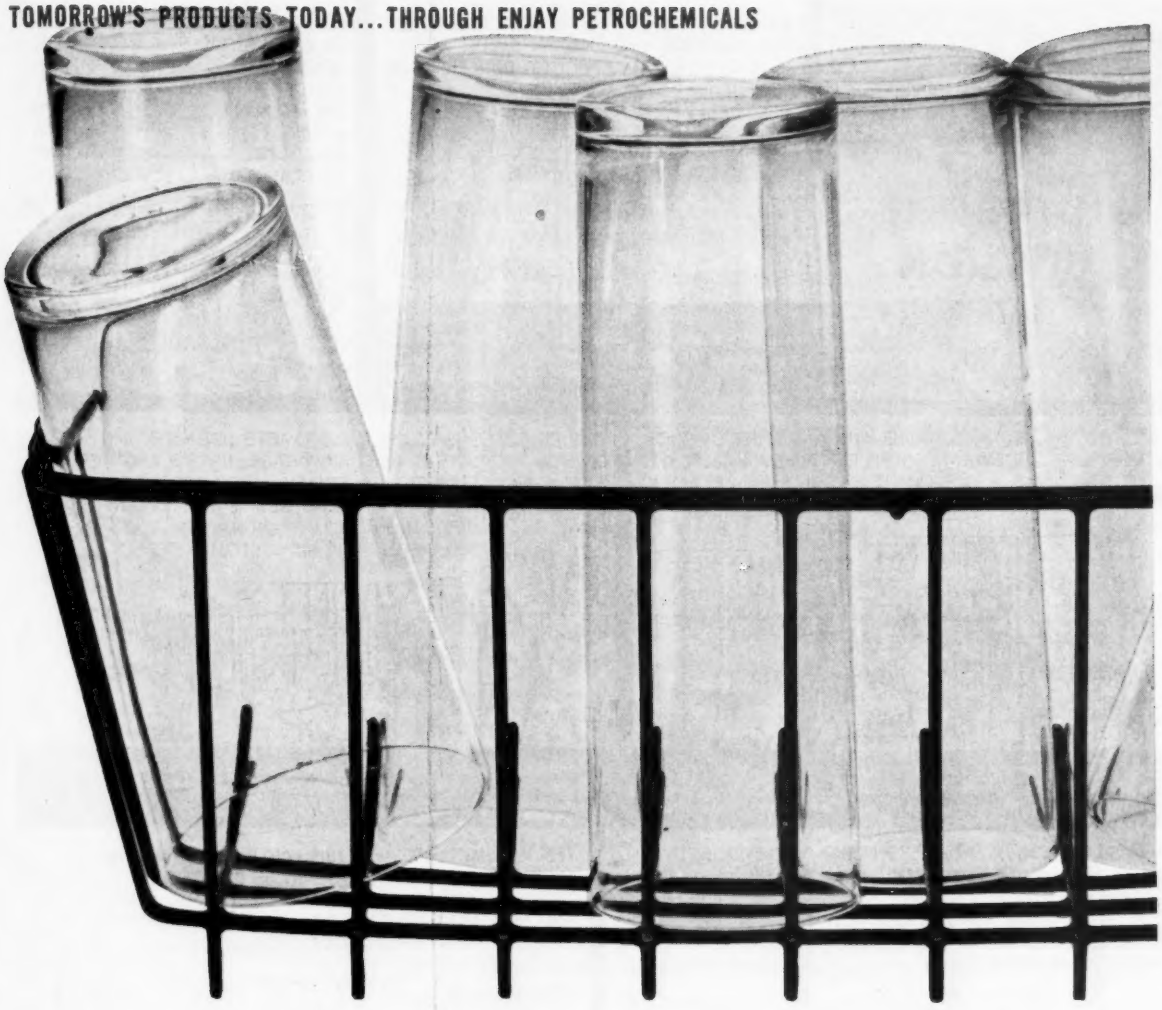
Truck breasts hub-deep foam blanket outside hangar. Foam will dry out and disintegrate to a powder.

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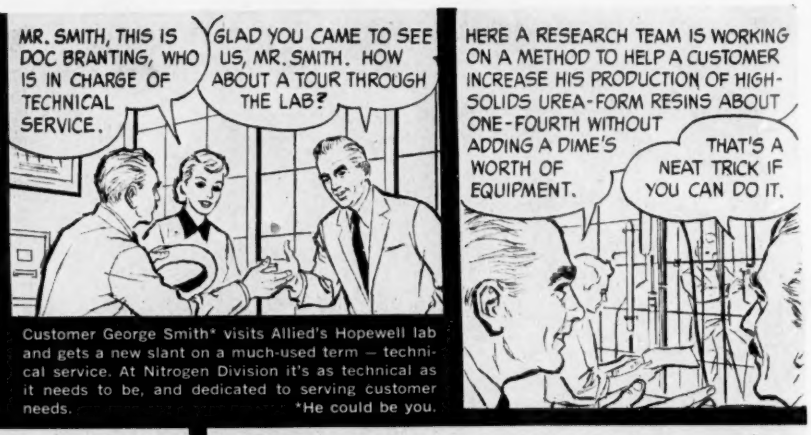
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Business
Newsletter

CHEMICAL WEEK
April 20, 1957

Striking stockholder-workers at your annual meeting? That's the situation faced by Union Carbide and Carbon this week. A delegation of striking workers from Linde's Buffalo plant plans to attend the annual meeting of UCC and present their claims that their strike is a needless one, causing financial loss to stockholders.

•

Dow is going ahead with plans for a second glycerine plant at its Freeport, Tex., division. Most major equipment has been delivered for the plant, which is due onstream next March and which will double Dow's glycerine output.

•

It looks now as if Brea Chemicals will go it alone—if at all— on the polyethylene plant it and Koppers planned to build near Los Angeles. Brea, a subsidiary of Union Oil, is now looking more closely at the San Francisco area—perhaps near Union's Wilmington, Calif., refinery.

There are several potential sources of ethylene in the region. Union could make it, although Tidewater Associated has more openly discussed the ethylene matter—it could produce it via gas recovery.

Standard of California seems to be the most likely source right now. Calso is considering making ethylene by gas dehydrogenation at its Richmond, Calif., refinery. It would most likely sell much of its output—besides Brea as a potential customer, Dow, Du Pont, Ethyl and other Contra Costa County chemical plants are eager for additional ethylene supplies.

Also planning to build in the San Francisco region is A. R. Maas. Maas, a Victor Chemical subsidiary, plans to make phosphoric acid and phosphate catalysts initially, and possibly phosphate detergents later. Maas has another new unit on the way, a $250,000 facility to make ethylene diamine tetra-acetic acid, and related chelating agents. The EDTA plant is being built at South Gate, Calif., which is Maas' home base.

•

At Newport, Del., Du Pont has laid off 100 employees at its titanium metal plant, because, says the company, "of a decline in sales."

At Carthage, N. Y., St. Regis Paper has closed it paper plant, putting 100 employees out of work. Reason for closing: inability to operate the plant economically. It will sell the property.

At Lockport, N. Y., W. R. Grace will gradually close its Cryovac Division plant. Most of the plant's equipment will be moved to Toronto, where a new plant will soon be built.

Du Pont has canceled royalty-payment contracts on urethanes. Du Pont, which is already licensing coating and foam manufacturing procedures to over 100 firms, canceled the 1½%-of-selling-price royalty payments in an effort to encourage its sales of isocyanates (the raw materials for urethanes) as well as to simplify bookkeeping procedures for licensees.

Rigid urethane foams, meanwhile, have a new challenger, the thermoset polyester foams developed by Vanguard Products (Newark, N.J.). Vanguard's rigid, unsaturated polyesters may also prove competitive to rigid styrene foams in structural insulating applications. The new foam, for which patents have been applied, features such advantages as low-cost (under $1/lb.), ease of bonding, compatibility with glass-fiber reinforcement. Vanguard, which offers pilot quantities of foam with densities of 6-30 lbs./cu. ft., may soon offer manufacturing licenses and technical help as well as the foam itself. Prime target now: insulation of refrigeration, transportation equipment.

•

Scratch Navadel as the name of the new pesticide-miticide developed by Hercules Powder *(see also p. 60)*. The name turned out to be too close for comfort to other tradenames in some countries where the agricultural chemical will be sold. The previous name, Hercules 528, will continue to be used while the search for a new name continues.

•

First commercial production of a surfactant from sugar is claimed by Berkeley Chemical Corp. (Berkeley Heights, N. J.). The material, a recrystallized sucrose dipalmitate, tagged Sucrodet D-600, is designed for use in the food, drug and cosmetic industries. Berkeley says it's the first of a series of sucrose esters it will make on a commercial scale; others from stearic, oleic, myristic and lauric acid are on the way.

•

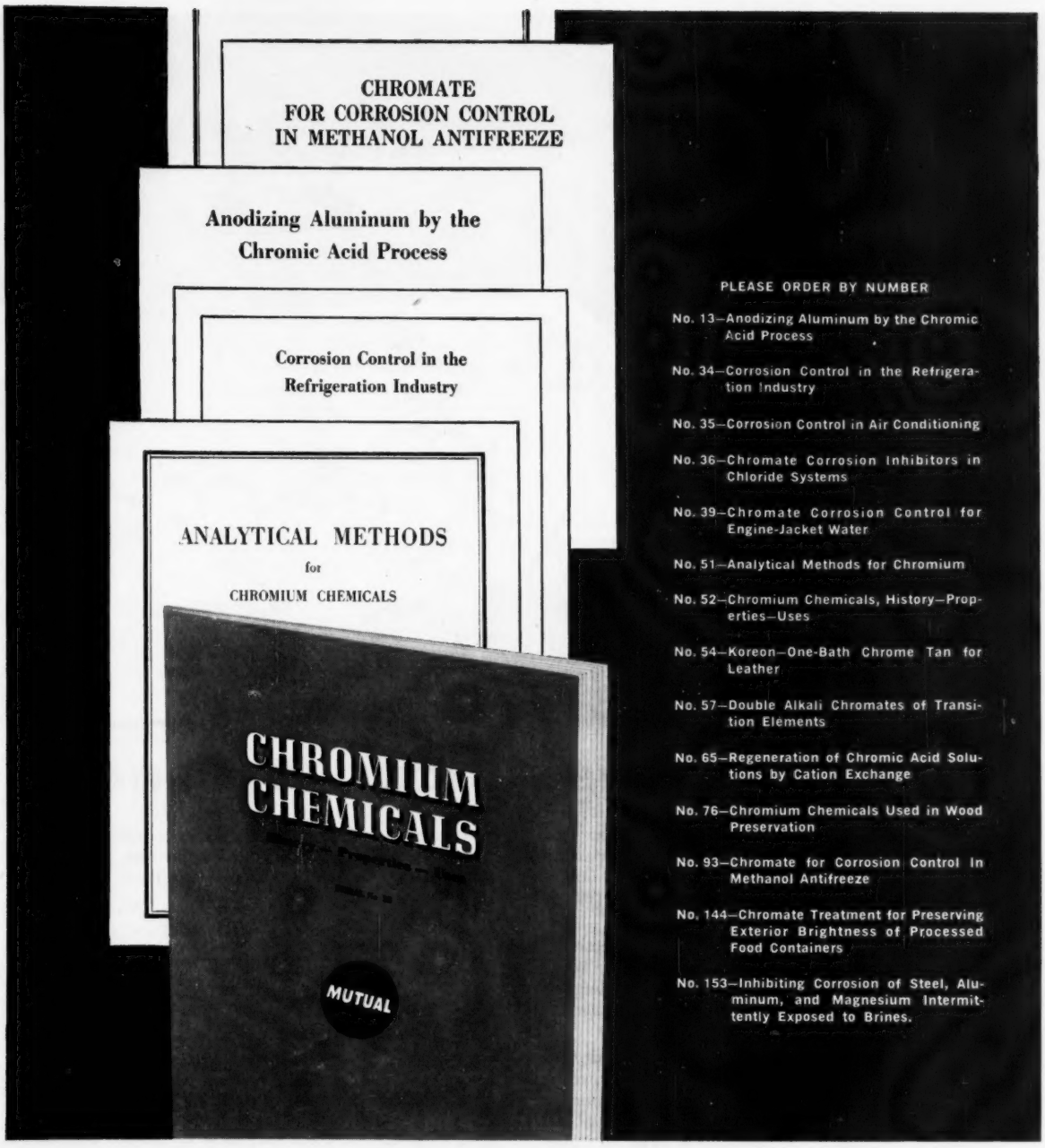
Monsanto will hike acrylonitrile capacity to 100 million lbs./year or more at its Texas City plant. Expansion should be completed by the end of this year.

Chemstrand Corp., synthetic fiber producer in which Monsanto shares ownership with American Viscose, has already slated 50% expansion of its Acrilan fiber facilities (to 45 million lbs./year). Acrylic fiber production is a major consumer of acrylonitrile.

Chemstrand has also just licensed Acrilan manufacture to the Italian firm of Societa Edison (Milan). A subsidiary, in which Chemstrand will be a minor stockholder, will make the fiber at a plant expected to be in operation within two years. Another Edison subsidiary is already making acrylonitrile.

•

A resolution not to meet in segregated cities was defeated last week in the sessions of the American Chemical Society. The matter arose last week as the ACS met *(see also p. 151)* in segregated Miami, Fla.



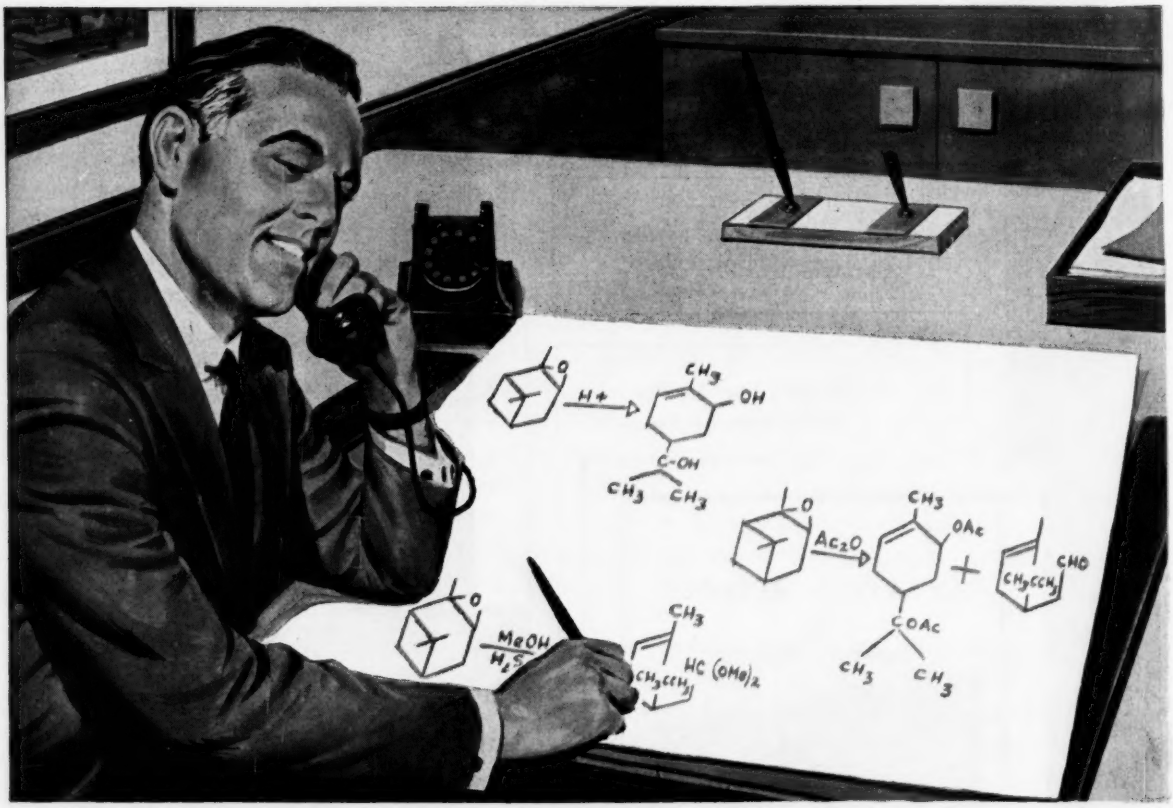
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Becco Dipentene Monoxide combines the reactivity of an epoxy group with that of an olefinic double bond in a cyclic terpene molecule. This compound undergoes the usual reactions of the epoxy group and the external double bond in a terpene molecule.

Becco *a*-Pinene Oxide combines the reactivity of an epoxy group with that of the bicyclic system of *a*-Pinene causing it to undergo some unusual reactions. It does not undergo the ring-opening reaction of an epoxide but rearranges in the presence of acid. In water solution, sobrerol is the main product; in anhydrous media, it is campholenic aldehyde.

These terpene oxides have many potential uses as intermediates in the manufacture of perfumes, flavors, pharmaceuticals, protective coatings, insecticides, bactericides, lubricant additives, adhesives, plasticizers, flotation agents, and in organic synthesis.

Typical properties of these epoxides are:

	% Oxirane Oxygen	F.P. °C	B.P. °C	Density at 20°C	Solubility
Dipentene Monoxide	8.9	<—60	74-76 (10 mm)	0.929	Insoluble in water. Soluble in most of the common solvents.
a-Pinene Oxide	9.4	<—60	61-62 (10 mm)	0.963	

Write Becco for experimental quantities and technical assistance in possible application for these compounds. Ask for Becco Bulletins Nos. 81 and 82.

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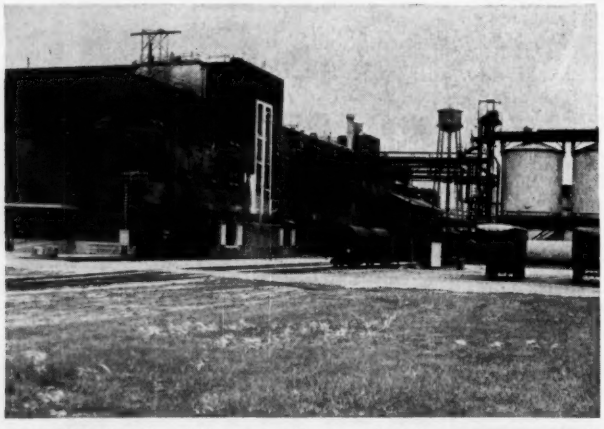
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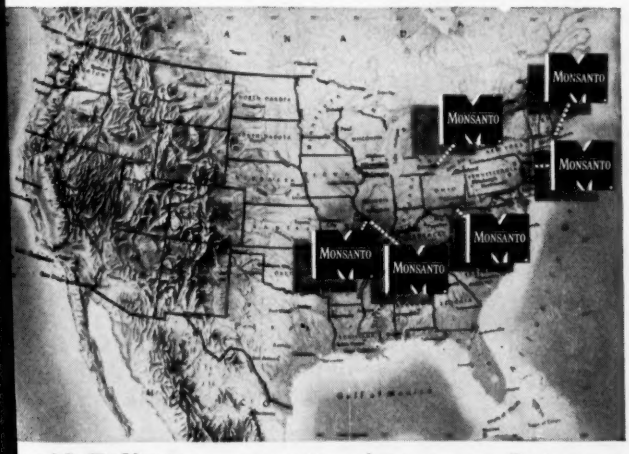
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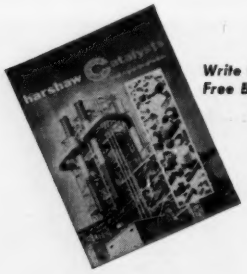
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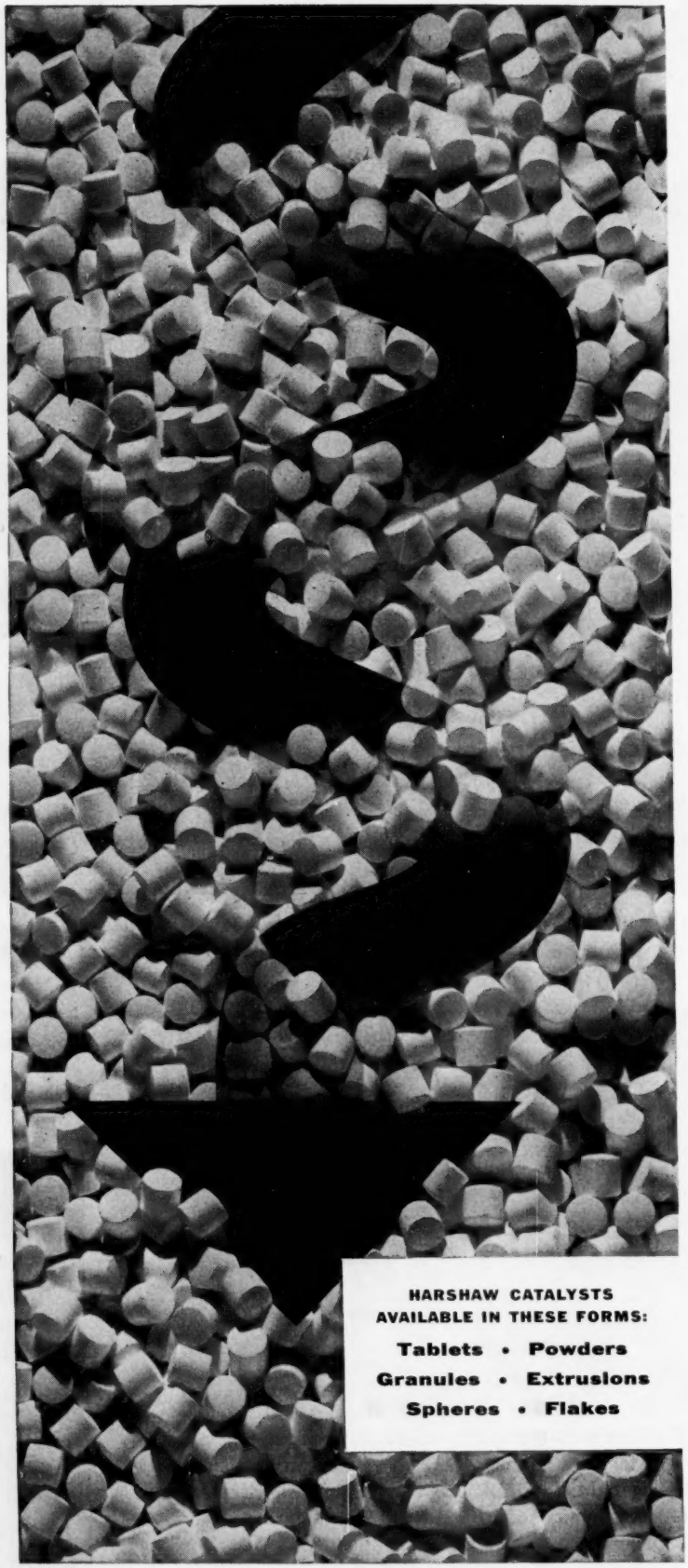
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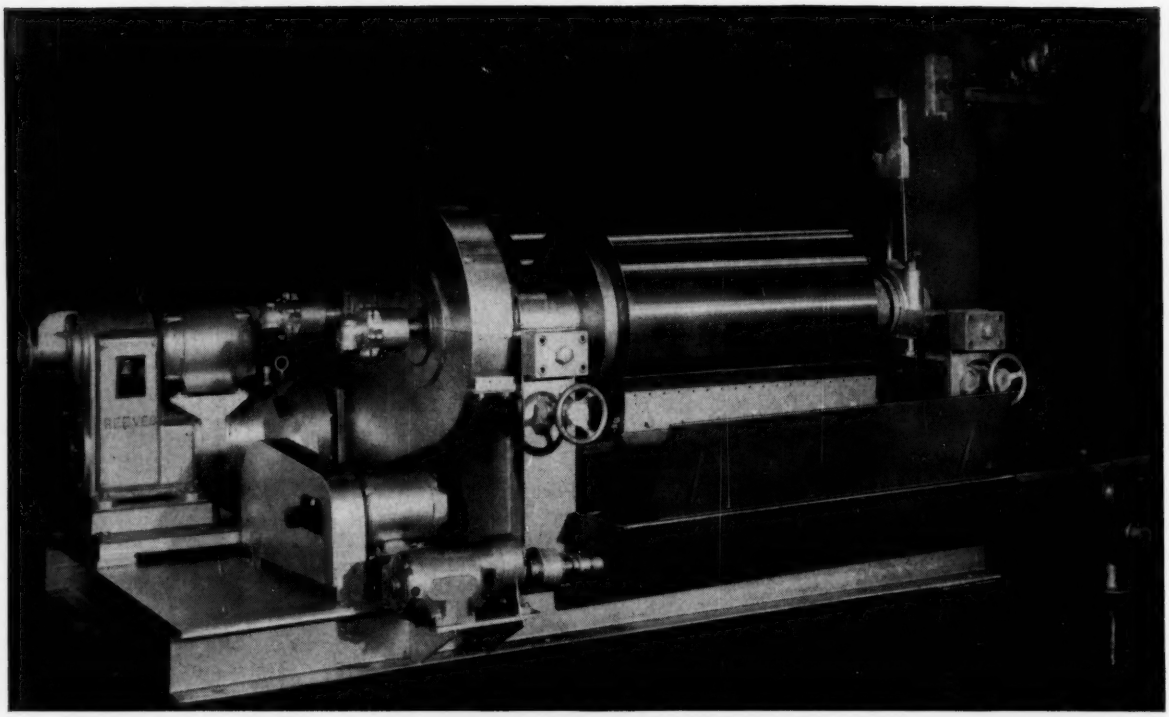


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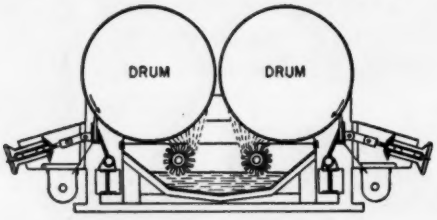
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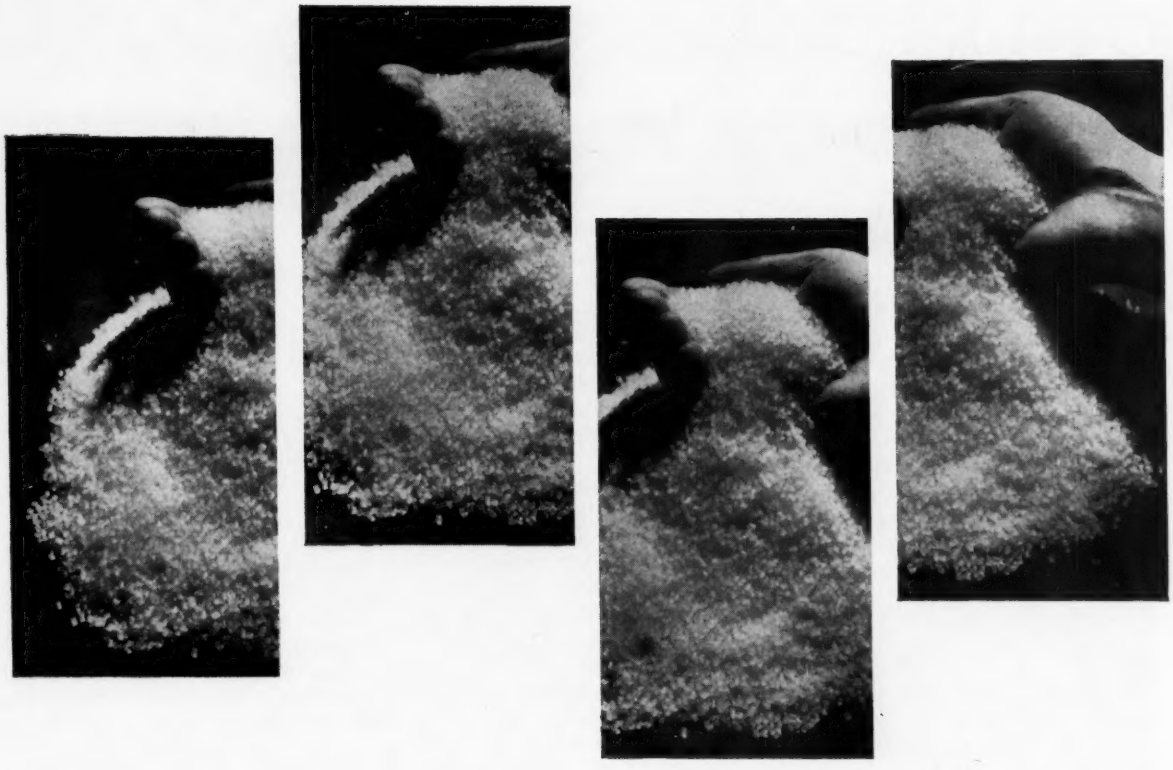
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Epolene, a low-viscosity, low-molecular weight polyethylene wax, offers properties useful to many different industries.

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If you use wax in your product, investigate the possible advantages of using Epolene. Thanks to Epolene's synthetic origin you are assured of a steady supply at a stable price. Send for samples and a booklet describing its properties and uses. Write EASTMAN CHEMICAL PRODUCTS, INC., subsidiary of Eastman Kodak Company, KINGSPORT, TENNESSEE.

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West Coast: Wilson Meyer Co., San Francisco; Los Angeles; Portland; Salt Lake City; Seattle.

OPINION

Hopeful About Law

TO THE EDITOR: [Re your article] advising of the problem that Rayonier Inc., has on the Altamaha River (*March 9*).

The recent session of the General Assembly of Georgia enacted laws governing pollution, and naturally everyone here in our state is hopeful that this law is the proper instrument to adequately cope with pollution problems. . . .

FULTON LOVELL
Director
State Game & Fish Commission
Atlanta, Ga.

Factual on Materials

TO THE EDITOR: I found the report, "Time to Turn the Atom to Profit," very interesting, and it will give your readers a good picture of the various operations in the commission's atomic energy program. I found the factual statements regarding the raw materials program to be accurate.

JESSE C. JOHNSON
Director
Division of Raw Materials
United States Atomic
Energy Commission
Washington, D.C.

Alkyd Emulsion Progress

TO THE EDITOR: Reichhold has had for many years a very broad and deep interest in the field of surface-coating emulsions, as indicated in your article, "Metal Gets the Latex Paint Treatment" (*Feb. 23*).

I would, however, like to clear up one point. While it is true we have "said little" lately about the German-developed water-thinned alkyd, which hasn't reached, domestically, a point of commercial perfection, we have said *much* about our 1504 alkyd emulsion, which we have been supplying since 1955 for industrial surface-coating applications. RCI's 1504 was the first commercially acceptable alkyd resin emulsion on the market. It has created a very substantial amount of interest and has been used for many applications throughout the industrial surface-coating industry.

We have every confidence that the industry is highly receptive to the introduction of resin emulsions that enable the paint formulator to obtain high-quality performance, equivalent to certain solvent finishes, without the drawbacks entailed by use of solvents: fire hazard, toxicity, solvent recovery, fume control and others, which differ depending on the type and method of application.

In our 1504, we have made very substantial progress toward these objectives, and we will shortly be offering a brand-new architectural emulsion, 1505, which will be as great an innovation in the interior high-gloss and semigloss trade sales field as 1504 was in industrials.

We appreciate your keen interest in water-thinned finishes and assure you it is shared by many, many others.

J. G. PENNIMAN
Manager, Emulsion Division
Reichhold Chemicals, Inc.
White Plains, N.Y.

CW welcomes expressions of opinion from readers. The only requirements: that they be pertinent, as brief as possible.

Address all correspondence to: H. C. E. Johnson, Chemical Week, 330 W. 42nd St., New York 36, N.Y.

Alaska Opportunities

TO THE EDITOR: Your article, "Process Plants Push Alaskan Statehood" (*Feb. 9*), was received with great interest. You are to be commended in the accuracy of your reporting. Generally, published articles on Alaska are too often inaccurate, misleading and mixed up with "The Shooting of Dan McGrew."

The points brought out in your article are the foundation for the development of Alaska. We Alaskans have great faith in Alaska's becoming an industrial giant, owing to her vast resources and aggressive people. . . . What we need, as pointed out in your article, is forward-looking men of industry who can see the opportunities offered by this great land.

We will be glad to answer any inquiries you receive on the article (from our viewpoint as manufacturers already established), as will Alaska's Chamber of Commerce, which has prepared economic surveys that could serve as guideposts for interested parties. . . .

CARL A. GRENCI
Manager
Anchorage Oxygen Co.
Anchorage, Alaska

Expansion Potential

TO THE EDITOR: . . . We are very grateful for the fine article on the Buffalo-Niagara chemical industry (*March 16*). It is an excellent report on the area's leading place in the nation's chemical industry. Particularly pleasing is the fact that it points up our area's great potential for unlimited expansion in the industry through increased research. . . .

CHARLES C. FICHTNER
Executive Vice-President
Buffalo Chamber of Commerce
Buffalo, N. Y.

MEETINGS

American Industrial Hygiene Assn., conference, Kiel Auditorium, St. Louis, April 22-26.

Assn. of Consulting Chemists and Chemical Engineers, Inc., symposium: International Science, a Catalyst for World Security; Belmont Plaza Hotel, New York, April 24.

American Zinc Institute, Inc., 39th annual meeting, Drake Hotel, Chicago, April 25-26.

Scientific Apparatus Makers Assn., 39th annual meeting, the Greenbrier, White Sulphur Springs, W. Va., April 27-May 2.

American Oil Chemists' Society, 48th annual meeting, Roosevelt Hotel, New Orleans, April 29-May 1.

American Material Handling Society, materials handling conference, Convention Hall, Philadelphia, April 29-May 3.

European Federation of Chemical Engineering, symposium on chemical reaction engineering, Amsterdam, May 7-9.

Electrochemical Society, Inc., 111th meeting, Hotel Statler, Washington, May 12-16.

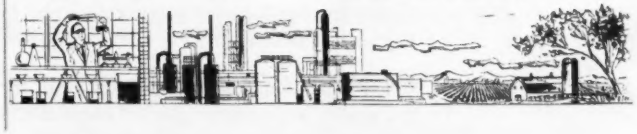
Synthetic Organic Chemical Manufacturers Assn., outing, Skytop, Pa., May 27-29.

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- ✳ POTASSIUM CHLORATE
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Canadian Process Firms Fared Well in 1956

Company	Sales (millions*) 1954	'55	'56	Percent Change '55-'56	Net Profit (millions*) '54	'55	'56	Percent Change '55-56	Percent Profit Margin '54	'55	'56
Abitibi Power & Paper	$114.0	$123.2	$132.5	+7.5	$10.6	$13.9	$15.4	+10.0	9.3	11.3	11.6
Aluminum Ltd.	327.7	412.2	483.0	+17.0	35.0	48.2	55.7	+15.6	10.7	11.7	11.5
Aluminum Co. of Canada	235.9	275.2	309.2	+12.3	33.1	41.2	45.3	+9.9	14.0	14.9	14.6
Canadian Celanese	—a	—	—	—	1.5	1.9	2.0	+5.5	—	—	—
Canadian Chemical & Cellulose	28.5	37.7	39.0	+3.4	(5.2)b	(1.5)b	0.04	—	—	—	0.0
Canadian Industries Ltd.	—c	118.9	129.8	+9.2	—	6.5	8.6d	+32.3	—	5.5	6.6
Dominion Tar & Chemical	—a	—	—	+11.0	1.9	3.8	4.9	+29.0	—	—	—
Du Pont of Canada	55.6	65.5	66.6	+1.7	4.2	6.4	5.0	—21.8	7.6	9.8	7.5
Goodyear Tire & Rubber of Canada	—a	—	—	—	2.5	4.4	6.2	+41.0	—	—	—
Imperial Oil	—a	—	—	—	49.6	62.2	69.1e	+11.0	—	—	—
International Nickel of Canada	352.3	416.3	444.7	+6.8	65.3	91.6	96.3	+5.1	18.6	22.0	21.6
Polymer Corp.	53.2	61.8	71.6	+15.8	4.9	7.5	9.5	+26.6	9.2	12.2	13.3
Shawinigan Chemicals	—c	29.2	31.8	+8.9	—	2.3	1.6	—30.5	—	7.9	5.0
Superior Propane	2.9	3.6	4.9	+39.0	0.2	0.2	0.2	0.0	6.9	5.6	4.1

*Canadian dollars. b Deficit. d Net profit increased by $1.9-million tax reduction.
a Not disclosed. c Not applicable. e Preliminary report.

Profit Squeeze Mars Canadian Picture

Canadian chemical process firms in 1956 showed better earnings than did their U. S. counterparts, judging from annual reports now being issued by the former.

Although patterns of sales-profits margins were similar to those of U. S. companies, the slice of Canadian industry represented in the chart (*above*) showed an average gain in net profits of 10.2%, while similar U. S. firms came up with 6.7% (*CW, March 16, p. 20*).

The same picture of stable or decreasing profit margins in the face of rising profits shows up in both countries.

The squeeze on Canadian profit margins stems from familiar factors: rising operating costs, new-plant startup expenses and market-development costs.

Canadian Industries Ltd., which set new sales and profits records in '56, cites these factors in its annual statement. Du Pont, which suffered a 21.8% drop in net from 1955, points to reduced prices for many of its products. The company's weighted index of selling prices dropped 9% in '56; nylon prices alone were down 18%.

For nine big companies, sales were up in 1956 an average of 11.2%, with net profits up an average of 9.1%. Profit margins, however, slipped 5.7%.

Outlook: Despite the difficulties encountered in '56 and anticipated manpower, materials and money short-

ages in '57, Canada's chemical process industries plan to invest $179.8 million this year in capital and repair expenditures, according to a Canadian government survey. This figure is 11.5% higher than the '56 estimate of $161.3 million.

But a breakdown indicates that spending will include about $2 million less for new construction (total: $51.6 million) and $20.6 more for repairs (total: $128.2 million).

Enthusiastic: And although margins and anticipated construction figures are down, Canadian chemical managers are no less enthusiastic about the long-term outlook for their industry.

The flow of orders going into chemical books continues to be heavy. It augurs good business for the coming year and well into '59. Here's the current picture:

- Sales volume is averaging about 10% ahead of the '56 pace, is expected to boost chemical output to about $1.15 billion for '57.
- Industry people are expecting an 8-10% hike in dollar sales in '57.
- Plant expansions and diversifications are providing a solid base for still-greater sales in the next several years.

Natural-resource industries are generating the predominant force for chemical sales. For example, a sharp increase in sulfuric acid production units is the upshot of vast uranium development at Blind River, Ont. And capacity-operation of pulp and paper mills demands large supplies of elemental sulfur from sour-gas fields in western Canada.

Too, the continuing rapid expansion in petroleum refining promises immense stores of hydrocarbons for petrochemical production—the most rapidly expanding segment of Canada's chemical industry.

But the big market for Canadian chemicals is not due to demand from any one source. It is largely the result of a high level of industrial output by chemical-consuming companies in all branches of industry.

That's why Canadians, who are now moving into the 25-year period that the country's economists say will be its greatest expansion period, foresee booming times ahead for the chemical process industries, the vanguard of Canadian business.



M&T'S MARTIN: He gets the nod as his company's

Proxy Fight Winner

The torrid proxy contest for control of Metal & Thermit Corp. ended last week as the group headed by company President H. E. Martin defeated an insurgent faction of stockholders and directors.

Final vote in the lengthy battle (*CW, March 9, p. 21*), tallied last week at the company's annual meeting, gave an 8-to-4 majority to Martin and his board nominees. But the victory was tempered somewhat by the defeat of Edward Anderson and James Stewart, two of Martin's 10-man slate. Stewart was one of three M&T board members representing the holdings of American Can Co. The other two Canco men, Russell C. Taylor and William C. Stolk, were re-elected.

The contest started several months ago when Martin said an "impasse" had been reached on M&T's board. Martin, who wanted to rapidly expand and broaden the base of the company, was voted down by six of the 12 board members—who also blamed his "business judgment" for the company's decreased earnings.

Among those remaining in the Martin camp were the three directors representing American Can's holdings. Using this as another point of conflict, the opposition group implied that Martin and his Canco associates were hoping to merge the two firms. Canco repeatedly denied any interest in acquiring the company.

Interhandel's Last Try

Sale of government-held stock in General Aniline & Film Corp. moved a step nearer last week when the U.S. Court of Appeals dismissed a plea by Interhandel, the Swiss holding firm, to vacate earlier dismissals of its suit to regain control of GAF.

The three-man appeals court unanimously upheld the dismissal made last Aug. 3 by Judge Bolitha J. Laws. He had dismissed Interhandel's suit because the Swiss firm had not produced the documents backing its case—documents the Swiss government had impounded and refused to release because of its strict banking laws.

The appeals court also found no error in the ruling a few weeks ago (*CW, March 23, p. 22*) by Federal Judge David A. Pine. Pine refused to grant Interhandel more time to get the needed documents; he also denied an injunction to restrain the sale of the government-held stock (bids on which will be opened May 13).

Where can Interhandel turn next in its legal fight? It can seek a reconsideration of the appeals court decision. It can ask the same court to block sale of the federally held stock. It can turn to the Supreme Court. But according to most observers, this decision of the appeals court is the severest blow yet to Interhandel, and its moves from here on will be last-ditch tactics.

Drugmakers Okay Fix

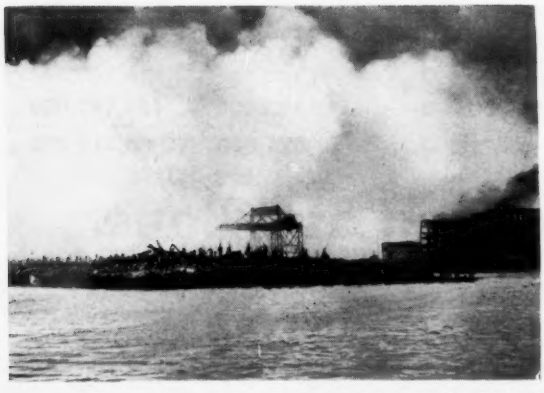
British pharmaceutical makers have agreed to a government proposal to fix prices on more than 4,000 proprietary drugs used by the National Health Service in Britain.

Minister of Health Dennis Vosper says the government is trying to establish "reasonable maximum prices" for the drugs, which account for over 90% of those prescribed under the service.

While it is not expected that the plan would bring about a general reduction in prices, it is designed to curb what the ministry considers to be excessive profits on some items. It's also expected to combat recent criticism over "high prices" that has been leveled at both American and British drug firms. The new scheme, designed to save the government about $2 million annually, would run for a trial period of three years.









1947 **Monsanto styrene plant, newly bought from the U.S. for $9.5 million, and a brand-new, $1-million polystyrene plant in flames at Texas City, Tex.**

1957 **Plant now makes twice as much styrene, has added vinyl chloride, polyethylene, methanol production, will have acrylonitrile capacity upped to 100 million lbs./yr.**

New Life from Texas City's Ashes

TEN YEARS AGO THIS WEEK, the French ship *Grandcamp* exploded in Texas City harbor, setting off a disaster that raged for three days, cost 570 lives, seriously injured 3,500, and caused damage estimated at $32.8 million. At Monsanto's styrene plant adjacent to the slip where the *Grandcamp* was being loaded with ammonium nitrate, 170 employes were killed. The plant suffered $4.75 million in damages, including the total loss of a polymerization unit that the company had erected only two months prior to the explosion at a cost of $1 million.

In February of this year, the federal government completed (except for a few holdouts) the settlement of damage claims resulting from the disaster. All told, about $16.5 million has been paid out to 1,700 claimants, many of them in behalf of Monsanto employees. Individual claimants averaged $9,619. Sixteen industrial claimants—almost all small businesses—received a total of $318,893.

Although federal courts absolved the government from liability, Congress passed a law in 1955 under which certain Texas City claims up to $25,000 would be assumed by the government.

Congressional Budget Cuts—the Score So Far

	Current Year Spending	'58 Spending Request	'58 Spending Approval by House
Federal Trade Commission			
Deceptive practices	$ 1,100,000	$ 1,100,000	$ 1,100,000
Antimonopoly	2,500,000	2,700,000	2,775,000
Veterans Administration			
Medical research	10,000,000	10,000,000	10,000,000
Securities & Exchange Commission	5,749,000	7,178,000	6,700,000
Civil Defense Administration			
Medical and equipment stockpiling	47,000,000	75,000,000	3,300,000
General Services Administration			
Strategic materials stockpile	none	130,000,000	none
Minerals subsidy purchases	21,000,000	70,000,000	none
National Science Foundation			
Research grants, surveys	31,000,000	56,000,000	31,000,000
Teacher training grants	9,000,000	9,000,000	9,000,000
Food & Drug Administration	6,779,000	9,300,000	9,300,000
Public Health Service			
Water pollution activities	4,420,000	6,610,000	6,610,000
Sewage treatment grants	50,000,000	50,000,000	50,000,000
Air pollution research	2,700,000	4,100,000	4,100,000
Health research	190,000,000	190,183,000	190,183,000
Business & Defense Services Administration	6,975,000	7,075,000	3,515,000

The Economy Axe: Blessing and Bane

The early rounds of Congress' economy drive on the 1958 budget spell chaos in some areas of government services, but improvements in others.

Big blow so far has been the denial of all funds to continue the Commerce Dept.'s 25 industry divisions, including the Chemicals & Rubber Division. The House voted to abolish them and their staffs after June 30. These groups form a major part of the Business & Defense Services Administration, for which only enough has been voted to keep alive the Office of Technical Services, the area development program and departmental field offices.

BDSA is stumping hard to reverse the slash, and commerce officials are optimistic that the Senate will restore most of the $3,560,000 pared by the lower chamber. BDSA, after the House's initial action, said it would settle for the same amount it got in 1957.

Other Requests: On other money bills, the cuts were less drastic—and many programs of importance to chemical firms got substantial boosts.

- More money was voted to the Federal Trade Commission for antimonopoly work and deceptive practices investigations. But the agency lost $100,000 it had asked for to enlarge its statistical studies.
- Food & Drug Administration received a 16% expansion allowance for its enforcement staff—including chemists and other scientists. Prospects are considered good for FDA's proposed new headquarters and Detroit district office-laboratory building.
- National Science Foundation lost the additional money it wanted for equipment modernization, may also have to curtail some of its plans for continuing reports on nongovernmental research spending.

Data collection, research on new control methods and federal enforcement in the water-pollution field will be stepped up. The House approved a 50% boost in Public Health Service funds for such activity—along with a similar boost for federal air-pollution research.

- The House was generous—again—with funds for medical research, including a number of drug-evaluation and development programs by the National Institutes of Health, the Veterans Administration and other agencies. NIH's tranquilizing-drug evaluation program is expected to move at a faster pace next year—including a start, at least, on large-scale clinical trials.

How the final budget will look when Congress is finished, nobody cares to guess. But, judging from the slashes it has already taken, there's good reason to believe that further cuts are in the offing.

COMPANIES

Borden Co.'s chemical division has acquired Lawrence Process Co., Inc. (North Andover, Mass.). Lawrence, with its recently completed plant for extrusion of vinyl plastic products, will be operated as a wholly owned Borden subsidiary.

•

Columbia Gas System Inc. is offering 1,675,415 common shares to present stockholders on the basis of one new share for every 13 held. Part of the proceeds will presumably be used to finance the company's joint venture with Commercial Solvents to produce ethylene oxide and other hydrocarbons (*CW Business Newsletter,* Nov. 17, '56). The rest will go to help finance new construction for the corporation subsidiaries.

•

Geigy Chemical Corp. (Ardsley, N. Y.), has acquired an interest in Aula Chemicals, Inc. (Elizabeth, N. J.). The New Jersey firm will continue its operations as an affiliate of Geigy. Terms of the transaction were not disclosed.

EXPANSION

Synthetic Fibers: Chemstrand Corp. will boost production of Acrilan acrylic fiber at its Decatur, Ala., plant from 30 million lbs. to 45 million lbs./year. New facilities should be ready by early '58.

Chemstrand also plans to increase the capacity of its Pensacola, Fla., nylon plant to 114 million lbs./year by mid-'58 (*CW, Nov. 3, '56*). Present output is 59 million lbs./year.

•

Pulp: The Canadian government has approved a proposal submitted by Ellis E. Patterson & Associates (Studio City, Calif.) to build a $40-million pulp mill in the Meadow Lake area of Saskatchewan, 150 miles northwest of Prince Albert. Minimum output will be 300 tons/day, with options on additional timber to provide for possible expansion to 600 tons/day. Construction will get under way this fall.

•

Metals: Fansteel Metallurgical Corp. will add a new research unit and a building to produce sintered powder metallurgical products at its North Chicago plant. The company's metals fabrication and metals and chemicals divisions will convert the old research labs to production facilities. Contractors Haglund & Ames Inc. (Waukegan, Ill.) will start construction immediately, plan to complete it by Jan. 1, '58. Cost: $665,000.

•

Lime: North American Cyanamid Ltd., Canadian affiliate of American Cyanamid, will build a 300-tons/day lime burning plant on the outskirts of Beachville, Ont. Catalytic Construction of Canada Ltd. will engineer the project.

Natural Gas/Sulfur: Shell Oil Co. is negotiating to build a natural gas and sulfur-extraction plant in Okotoks gas field near Calgary, Alta. Proposed output is 30 million cu. ft/day of natural gas, with 300 tons/day of sulfur as a by-product.

•

Cellulose: TCF of Canada Ltd. will double the capacity of its Cornwall, Ont., plant for making transparent cellulose packaging film. Construction will get under way immediately; completion is scheduled for mid-1958.

•

Atomic Wastes: The Atomic Energy Commission will add three 300,000-gal. and one 1.2-million-gal. underground storage tanks to handle radioactive waste materials from its National Reactor Testing Station near Arco, Idaho. It will also install a waste calcination unit, a waste treatment building and two large concrete vaults for storing solid plant wastes. Cost of the entire project is estimated at $3 million. Fluor Corp. (Los Angeles) will do the engineering.

FOREIGN

Rayon/Britain: British Celanese and Courtaulds, Ltd., Britain's two largest makers of rayon and other synthetic fibers, will merge. Courtaulds, which has assets of $350 million, will acquire British Celanese, valued at $90 million, in what will be Britain's biggest merger in years.

•

Aluminum/French Guinea: Canadian Aluminum Industries, Ltd., will invest $100 million to develop bauxite deposits and build an aluminum factory at Boko, French Guinea. The 220,000-tons/year plant should be in operation by 1961.

•

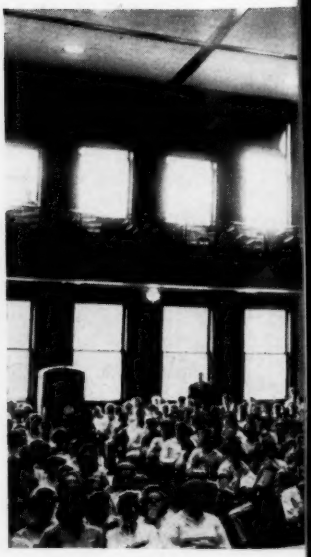
Electrolyzers/India: Outbidding its U.S., Canadian, Swiss and Norwegian rivals, the Italian firm Oronzie de Nora (Milan) has obtained a $7.35-million order to supply electrolyzers for the Nangal heavy-water and fertilizer project. Over-all costs for the fertilizer and heavy-water plants, which should be in operation by April '59, will be $16.8 million and $4.2 million, respectively.

•

Synthetic Fiber/China: More than 100 East German firms will reportedly participate in a plan to bring synthetic fibers to Red China. Among the companies joining to build a modern synthetic fiber plant are Erste Maschinenfabrik Karl-Marx-Stadt, Chemnitz Maschinenfabrik Halle, and Veb Rohrleitungsbau Bitterfeld. The new plant will operate 688 bucket spinning machines each 52 ft. long. Also, the East German firm Veb Construction and Development of Textile Machines Chemnitz, has obtained a quotation by the Red Chinese government for a polyamide fiber plant to start operation in 1959.



Clark visits Burgettstown area, where he started high school.



Students listen to Clar

To Tell of Progress: Home Town Revisited

How can people all over the United States be made aware of the chemical industry's benefits to them? This question, asked by local Chemical Progress Week committees everywhere, found many answers. One novel reaction: send men with science degrees to their former home towns to talk of chemical progress. A pilot group of 10 were sent from New York to such locations as Concord, Mass., McGehee, Ark., Columbus, O., Bluefield, W. Va., and Burgettstown, Pa. To Burgettstown (population 2,379), a coal-mining community near the Ohio border, went Robert Clark, 36-year-old assistant to the sales manager of Allied Chemical's Semet-Solvay Petrochemical Division. Here's what he did in telling Burgettstown of the impact of the chemical industry, in showing high school students the benefits of science and engineering training.

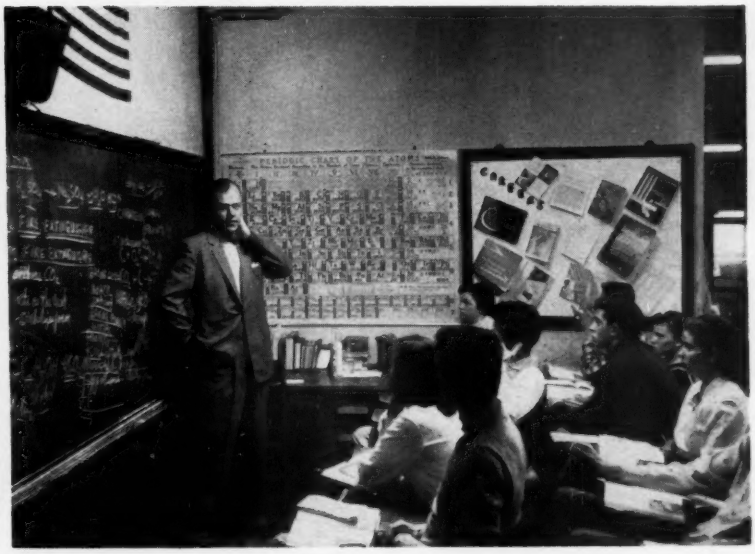




Question-answer session brought out pupils' career interests, while discussion period answe



plea for more scientists.



In classroom talk, Clark outlines science study needs.



With principal, he discusses teaching.



Old times live again as Clark talks with high school teacher who helped start him on career. He trudged same steps before his graduation in '38.



cific queries on scholarships.



Friendships are renewed at Climax Molybdenum, where Clark took first industrial job while finishing chemical engineering course at Washington and Jefferson.



At dinner talk before Lions Club, Clark tells business men how they get benefits from technological development, why they should encourage science students.



Journey's end finds Clark leaving air terminal. He reported high interest in his mission, felt it forged vital link between industry and public.



Poor color in this sample of sodium toluene sulfonate resulted from use of competitive nitration-grade toluene.



The clear solution of sodium toluene sulfonate shown above was prepared from high-purity Sunoco Toluene.

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The reason: *Every shipment* of Sunoco Toluene surpasses the most rigid standards set up by the industry. Make your own comparison test from the specification chart listed here. If you use toluene in your processing, it will pay you to try Sunoco Toluene. You can see for yourself why it helps solve so many problems of color and purity in end products.

For complete information, see your Sun representative . . . or write for Technical Bulletin 27. Address SUN OIL COMPANY, Phila. 3, Pa., Dept. I-6.

MAKE YOUR OWN COMPARISON TEST

TYPICAL ANALYSIS

	SUNOCO TOLUENE	YOUR PRESENT TOLUENE
Olefin Content Acid Wash	1	
Bromine Index	Negligible	
Paraffin Content	0.0	
Residue after Evaporation	Not Detectable	
Thiophene Content	None	
Sulfur Content	0.001% by wt.	

OTHER SUNOCO PETROCHEMICALS: Benzene, Xylene, Naphthenic (Sunaptic) Acids, Propylene Polymers, Anhydrous Ammonia, Sulfur, Petroleum Sulfonate, and Liquid Petroleum Polymer (PDO-40)

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INDUSTRIAL PRODUCTS DEPARTMENT

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Steroids from Sisal: Latin America's Bid for the Hormone Business

Last month, Productos Esteroides, S. A. (Mexico City) passed the first commercial milestone in its two-year effort to produce a new line of steroid intermediates from sisal sapogenins.

Though European steroid producers have long used sisal-derived materials in cortisone manufacture, the plant has previously been cultivated in the Western Hemisphere only for the durable hemp fiber obtained from its leaves. PESA's first commercial sisal-derived sapogenin—hecogenin—is already being sold to European companies; the second—tigogenin—is currently being processed into several hormone precursors that the company hopes to make commercially available before the end of the year.

Newest link in the sisal processing chain is a $200,000 extraction-concentration plant just completed at Ciudad Victoria (500 miles north of Mexico City). It's here that the sisal sapogenins are separated into the crude raw material for processing at PESA's Mexico City plant.

Exploitation of the sisal sapogenins was sparked by Irving Sollins, director and principal stockholder of PESA's corporate parent, Root Chemicals Inc. (Puerto Rico). A former Syntex official, Sollins directed the five-man technical staff responsible for the development of processes used by Root Chemicals and PESA. Both firms now produce diosgenin—basic intermediate of 16-dehydropregnenolone acetate, which, in turn, is an intermediate for various androgens, estrogens and hydrocortisone precursors—from barbasco root (*dioscorea floribunda*). The new sapogenins will be a welcome complement to the organization's diosgenin, predicts Sollins. Too, he feels their use will make commercially



SISAL LEAVES that will yield steroid intermediates are cut from plant in traditional manner.



LEAF CROSS-SECTION: Tough exterior surrounds hemp fibers. Leaf is decorticated to get at chemicals in the fiber mass.



HARVEST COMES IN: Bundles of sisal leaves are brought in from plantation.

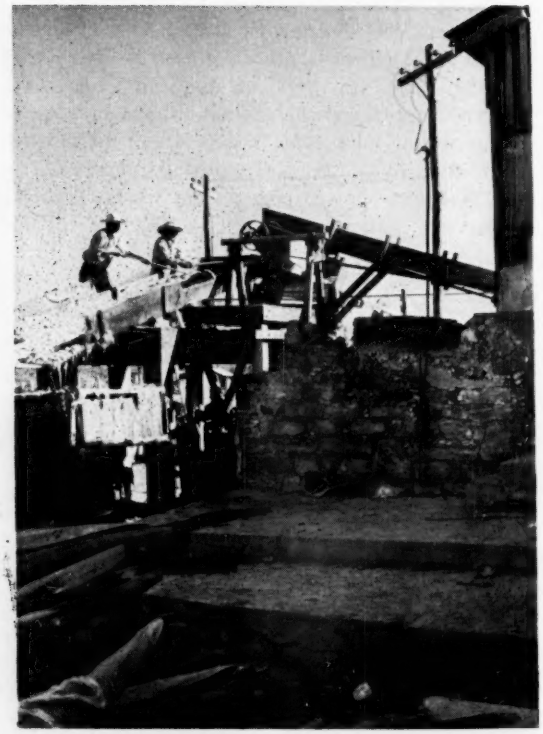
Photos: EZRA STOLLER



DEHUSKING: Workers feed leaves to decorticator for freeing of hemp fibers at Ciudad Victoria plant.

HEMP DRYING: After washing, fibers are hung out to dry. Fibers have been main sisal product for years.





WASTE FOR PRESSES: Pulp waste, bagasse, is conveyed to series of presses for saponin juice extraction.



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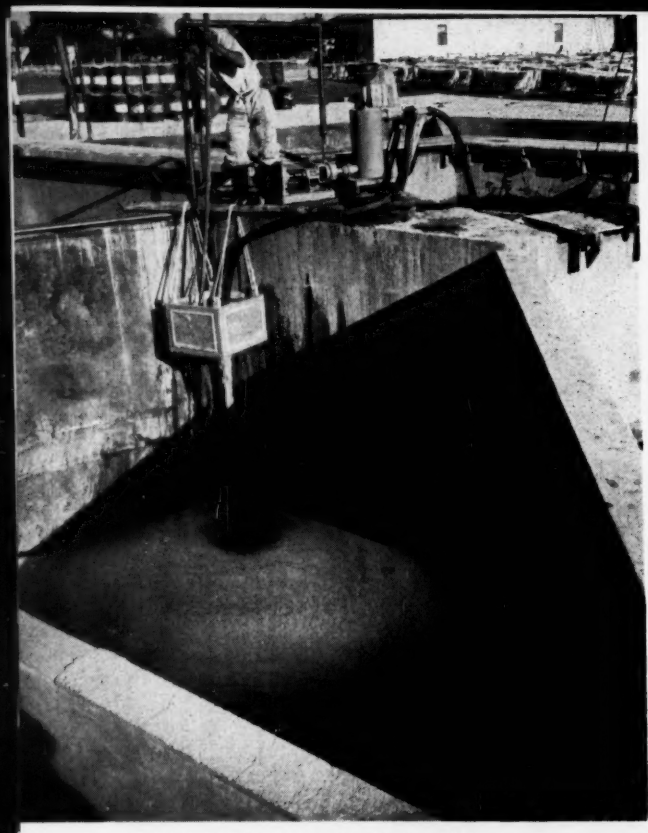
Clairton, Pennsylvania

Plants:

Clairton, Pa.; West Elizabeth, Pa.; and Chester, Pa.

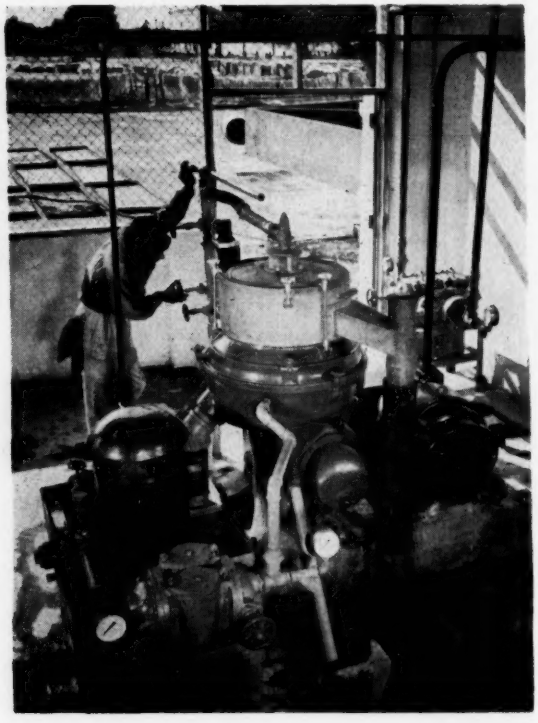
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FERMENTATION: Tank is filled with day's yield—100,000 liters of sisal juice.

CENTRIFUGATION: Partly hydrolized sapogenins are separated from waste products.



SUN DRYING: Molasses-like sapogenins are concentrated in shallow pans by solar heat.



feasible the production of hormone materials that have been only laboratory curiosities.

Three Keys: The process employed for recovering sisal sapogenins was developed by Luis Miramontes.* He succeeded where many others had failed in the difficult separation by coming up with three key processing tricks:

- An efficient physical separation technique for extracting the sisal juice from waste pulp.
- A new fermentation reaction for treating the sapogenin-rich juice.
- Chemical conversion of the crude hecogenin-tigogenin mixture into a readily separable form.

Here's how they fit into the process: Plantation-grown sisal (*agave sisilana*) is harvested in the traditional manner, transported to the Ciudad Victoria plant for processing. The tough leaves are first decorticated to free the longitudinal hemp fibers. After washing to remove remaining traces of juice, fibers are draped over wooden poles for drying in the sun.

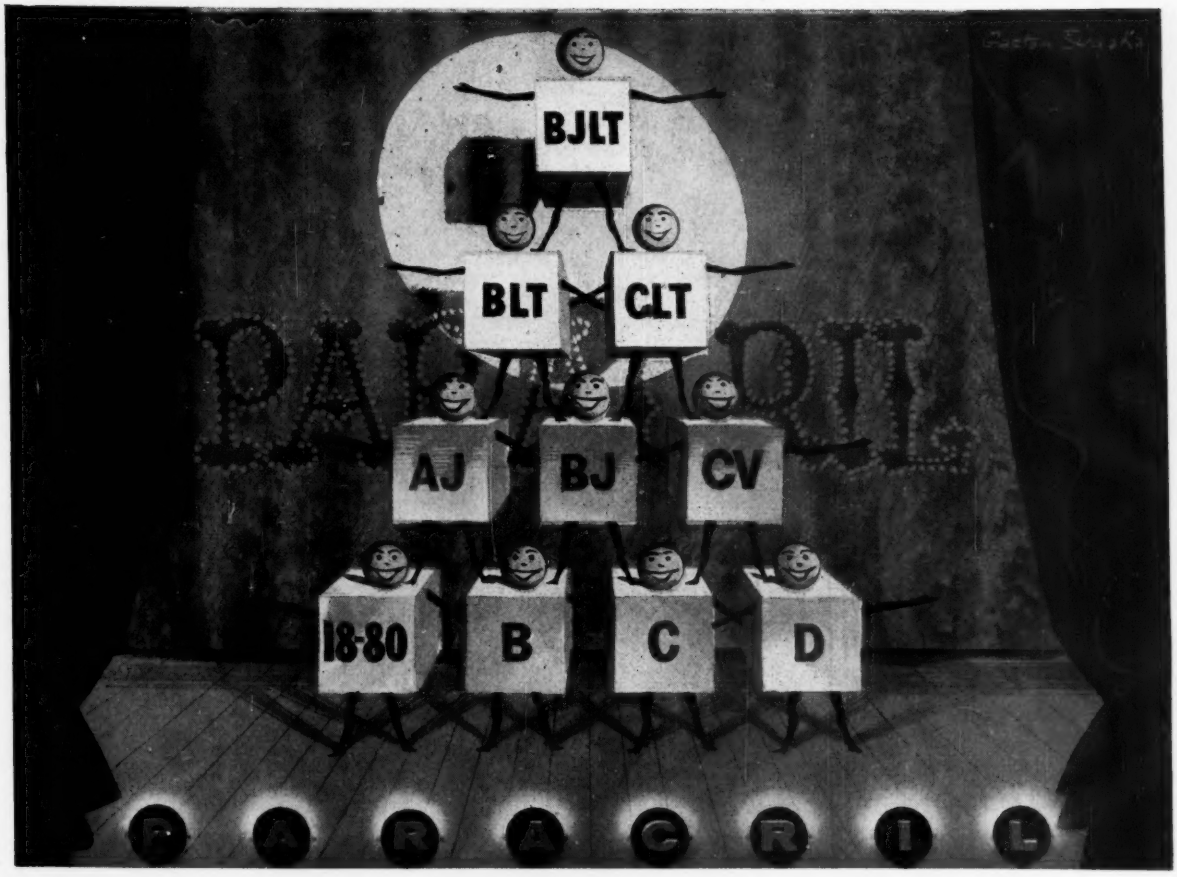
The pulp (a material which other fiber producers discard) is conveyed to a series of presses for extraction of saponin juice (saponins, crude sapogenins in complex mixture with sugars, pectins, other impurities). Because the spongelike pulp (bagasse) readily reabsorbs the juice, says Sollins, conventional pressing equipment couldn't be used. Instead, the company had to develop a special—and, it claims, patentable—machine to extract the juice by a series of pressing, rolling and squeezing operations.

Second key step in the process is

*Miramontes holds a bachelor's degree in chemical engineering, a Ph.D. in organic chemistry from the National University of Mexico and was a faculty member there when he started working on the sapogenin recovery process. Since late '55, he has been full-time director of research at PESA's Mexico City plant.

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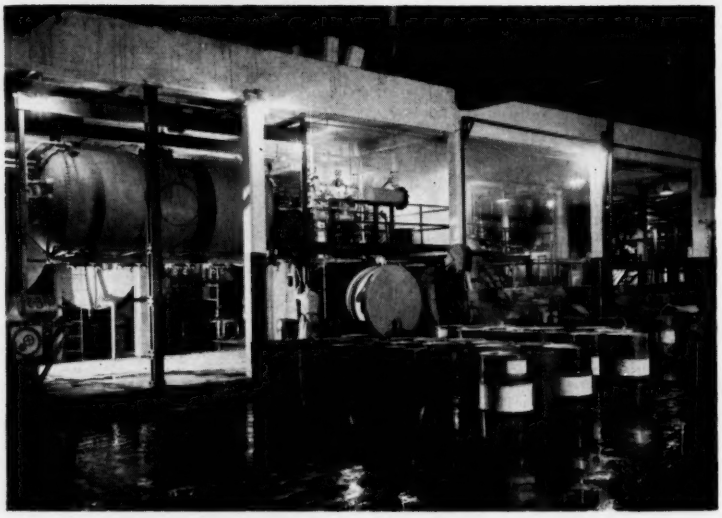
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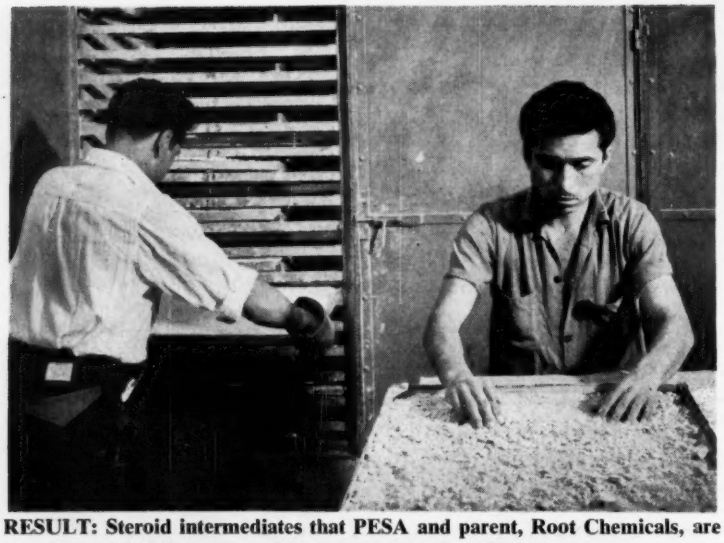
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DRIED SAPOGENINS look like this before hecogenin and tigogenin are separated by. . .



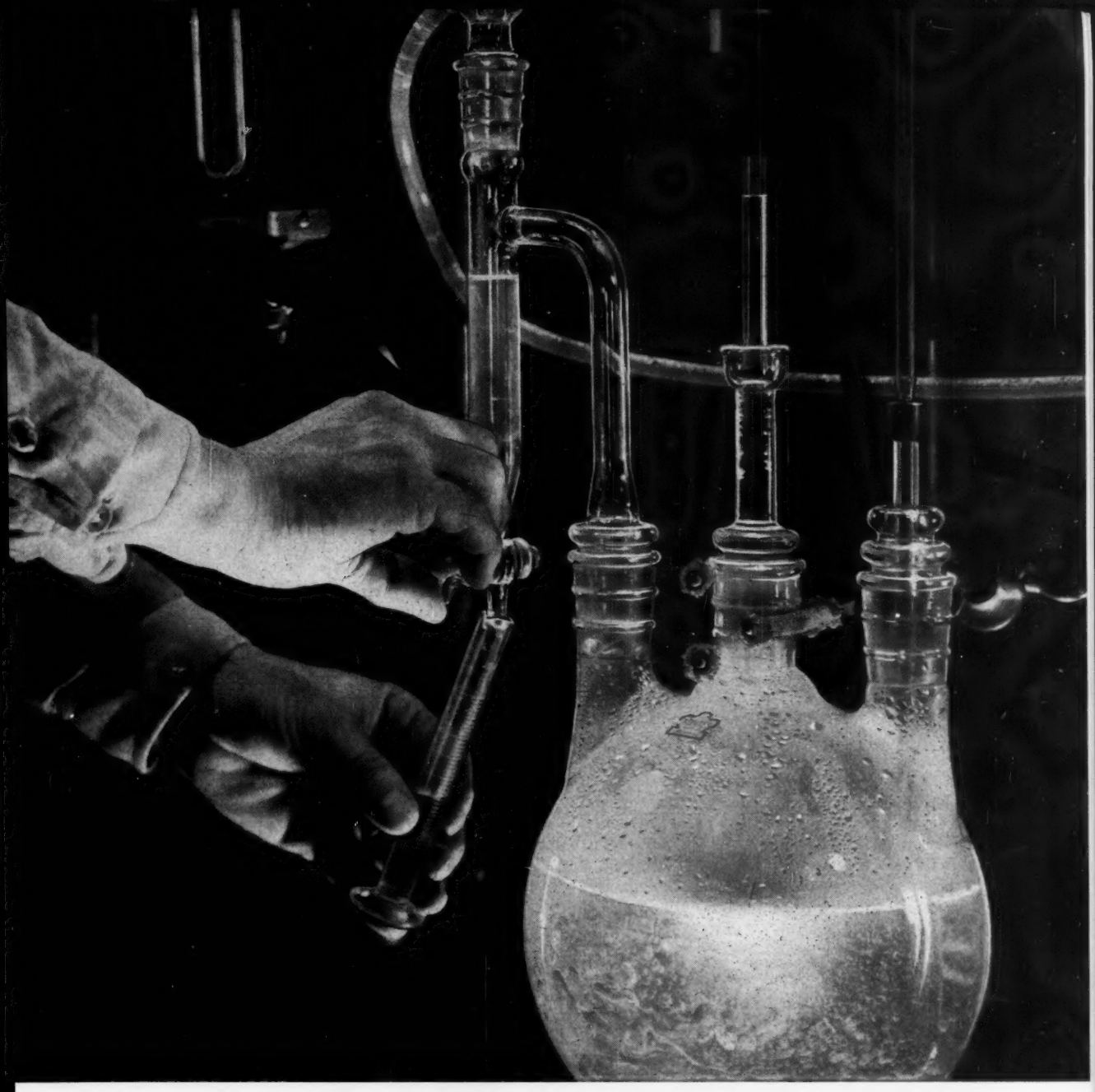
CHEMICAL REACTION. Devised by PESA, this follows hydrolysis, filtration and drying at Mexico City.



RESULT: Steroid intermediates that PESA and parent, Root Chemicals, are counting on for cheaper cortisones, plus some brand-new hormones.

fermentation of the juice under closely controlled conditions of temperature, time and pH in a concrete tank. The tank has seven compartments—one for each day of the week. Each compartment holds a full day's production of 100,000 liters of sisal juice, containing about 0.12% sapogenin. Fermentation is carried out using a carefully selected (and undisclosed) microorganism that also effects a partial hydrolysis of the sapogenins.

From the fermentation tanks, the extract is pumped to a holding tank that feeds a centrifugal separator. Centrifugation yields a heavy, molasseslike liquid and a light fraction bearing the pectins, vitamins, chlorophyl and sugars. (At present, the light fraction is discarded, but the company hopes to eventually recover commercial by-products from it.)



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The heavy liquid containing the desired sapogenins is run off into shallow pans for drying with artificial or solar heat. The dried product (about 3 tons/day are concentrated from each 100,000-liter batch of juice) is then shipped to Mexico City where the hecogenin and tigogenin are separated for further processing into specific hormone precursors.

Refining the Genins: At PESA's main plant, hydrolysis (with hydrochloric acid) of the dried material frees the sapogenin. Filtration and steam-drying then produce a crude mixture of the two products. It's at this point that the third processing trick is employed to accomplish the difficult chemical separation.

The usual method of splitting materials of this type would be to put the crude mixture into solution and extract one product with a selective solvent. But with the hecogenin-tigogenin mixture, says Sollins, this technique just doesn't work. To clear this process hurdle, PESA devised a chemical reaction (for which it has made patent application) that converts the entire mixture into compounds whose altered structure enables separation by fairly simple means. Sapogenin recovery is said to be almost quantitative, yields about 60 kilograms of each product in a day's operation.

New, Cheaper Hormones: Sollins feels the new intermediates will not only open up shorter, less costly routes to many of the cortisones but also will make production of some brand-new hormones possible.

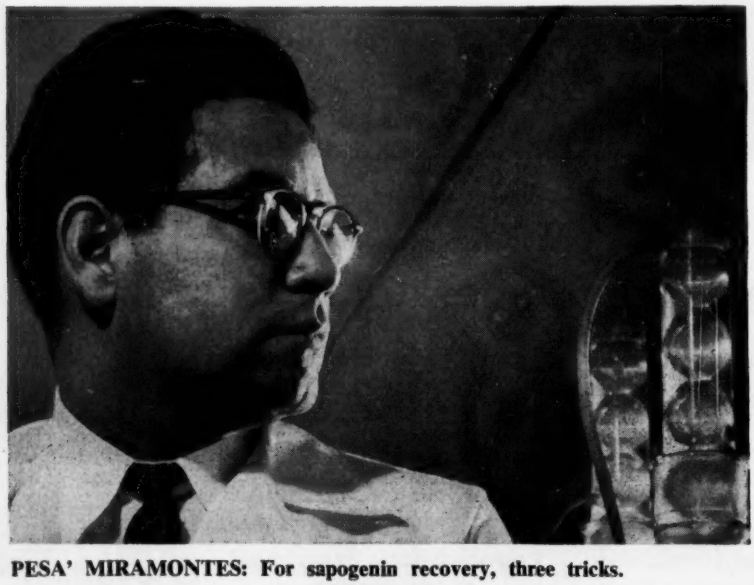
For example, hecogenin, which has an oxygen atom at the 12-position, can be converted into cortisone fairly simply by shifting it to the 11-position. And tigogenin's structure, says Sollins, makes it readily convertible into the allosteroid from which it's a relatively easy step to Δ^1 intermediates of the Δ^1 cortisones. Tigogenin, he adds, is also a desirable and likely starting material for the synthesis of intermediates leading to the newly developed 19-nor steroids. In this group is 17-ethyl-19-nortestosterone—G. D. Searle's Nilevar (*CW, May 5, '56, p. 62*).

Because it presents an economic means of going to estrone (female sex hormone) by direct synthesis (usual way is to first make testosterone, then convert that into estrone), tigogenin, Sollins predicts, will make the 19-nor steroids more practical, cheaper to produce.

Looking Ahead: Though the European steroid market presents a ready outlet for PESA's hecogenin, its tigogenin still faces an uphill battle to find commercial usage. But if it lives up to its early promise as a versatile starting material for many steroids, it may have a better than even chance to make the grade.

The most immediate goal for Root Chemicals and PESA is commercial exploitation of tigogenin. To that end, they're pushing devlopment of its derivatives, are currently preparing to participate in the National Institute of Health's "crash" research program to evaluate new steroids for cancer therapy.

At longer range, Root Chemicals is laying plans to re-establish in Puerto Rico the sisal industry that was squeezed out of existence there a number of years ago by the intense development (and economic advantages) of sugar growing. This move, says Sollins, not only will provide the necessary raw material for Root Chemicals' product diversification but also will be a useful addition to a more balanced economy on the island.



PESA' MIRAMONTES: For sapogenin recovery, three tricks.

EQUIPMENT

TDI Detector: A detector kit for toluene di-isocyanate and TDI-urea vapors, particularly suited for portable operation in polyurethane plastics manufacturing facilities, is a new offering of Mine Safety Appliances Co. (Pittsburgh). Kit has hand-cranked pump for drawing air samples at a 1-liter/minute rate for three minutes through glass impinger tube containing dilute acid solution. Addition of three liquid reagents prepares sample for color comparison with standards representing 0.05-, 0.10- and 0.20-ppm. concentrations.

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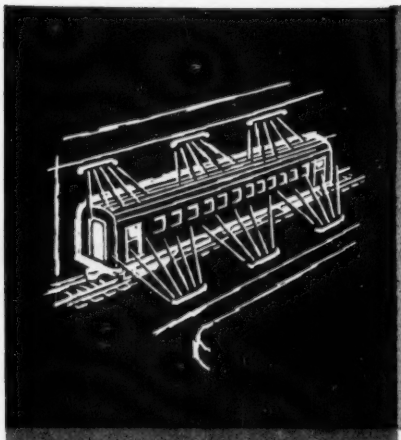
Portable Sump Pump: Schramm, Inc. (West Chester, Pa.), offers a new, self-contained portable sump pump that, it says, will handle corrosive and inflammable liquids safely. Pump body, impeller and strainer are made of bronze. Pump picks up liquids in depths of more than 1⅜-in., requires no priming. Strainer blocks out solids larger than ¾ in. Unit is 19⅜ in. high.

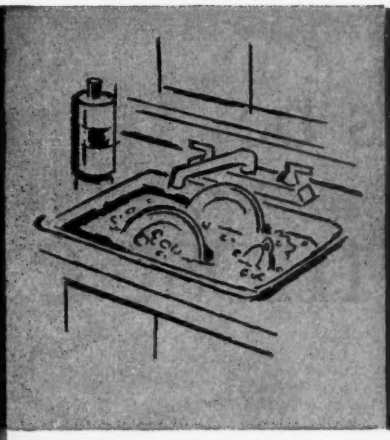
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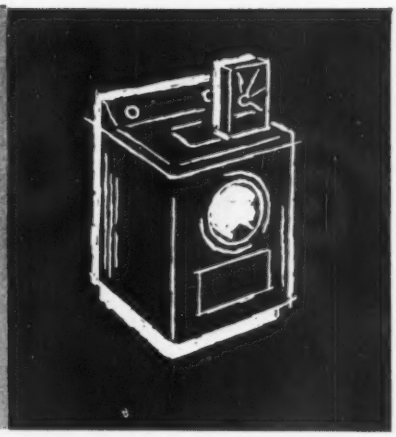
Polyethylene Ventilators: American Agile Corp. (Bedford, O.) is out with a new line of fabricated polyethylene ventilators and exhaust systems. Housings and rotors are polyethylene; no metallic parts are exposed to fumes or vapors. Ventilator sizes may be selected for ⅛- to 4-in. static pressure range, 100- to 3,400-cu. ft./minute of air movement.

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Plastic Valves: A new series of small plastic valves for corrosive liquids and gases in atomic and radiation service is offered by Chemtrol Corp. (Comp-











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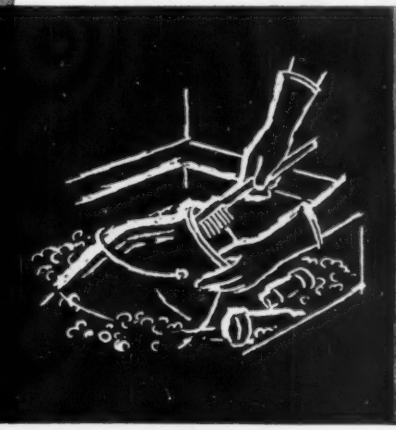
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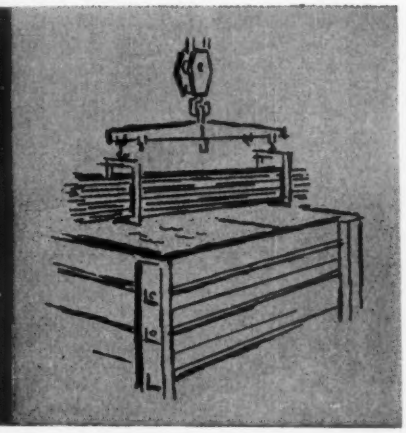
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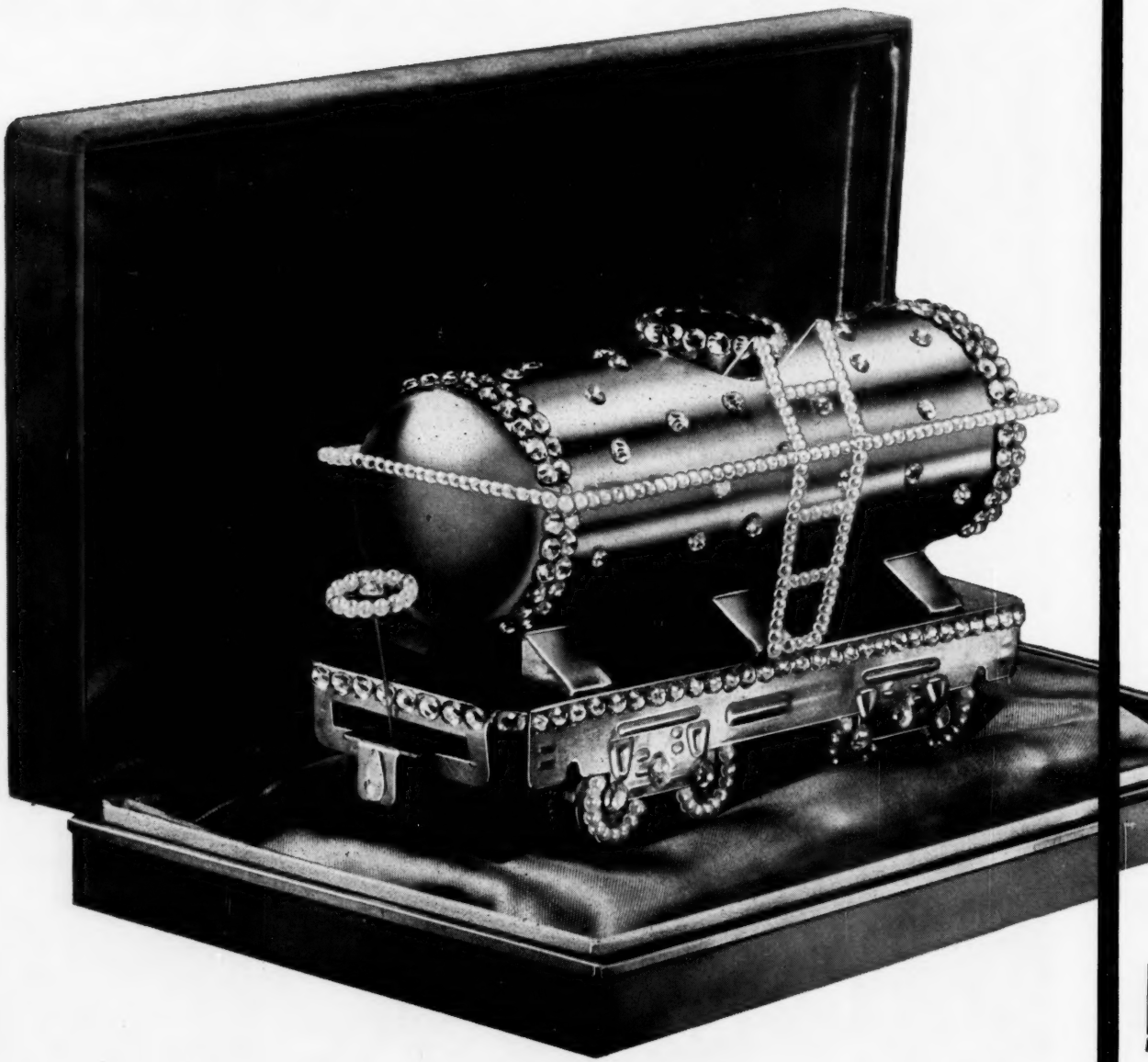
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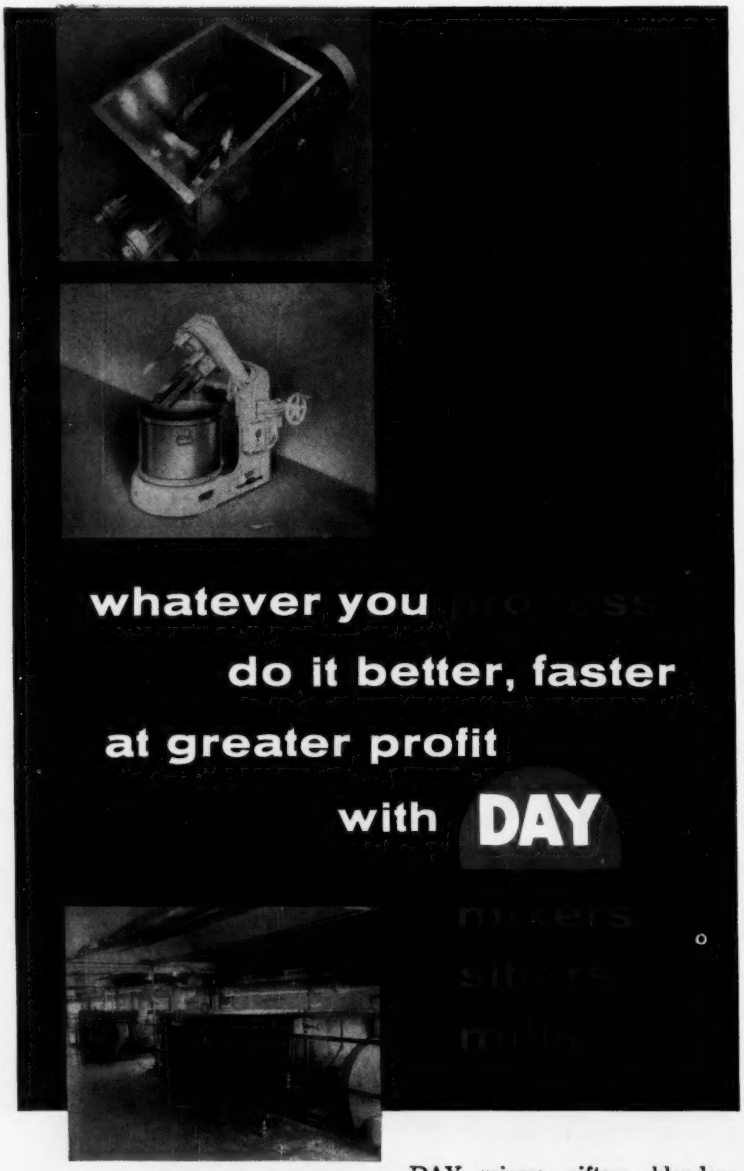
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PRODUCTION

ton, Calif.). PVC valves are recommended for temperatures to 170 F; Penton (chlorinated polyether) valves for temperatures to 250 F. Valves are trimmed with Teflon, Kel-F and 18-8 stainless steel. Sizes: ⅛ to ½ in.

•

Cooling Cab: A portable cooling compartment that permits workmen to take relief breaks right in their high-temperature working area is a new item of Peuchen Engineering Corp. (Wilmington, Del.). Called the Breeze Wagon Cooling Cab, the compartment resembles a truck cab, weighs less than 1,000 lbs., is mounted on wheels for easy rolling. Cooling system filters the air, dehumidifies as it cools. Temperature is thermostatically controlled from within the cab, can be reduced from 130 F to 70 F in less than one minute, says Peuchen. Pilot models seat two; four- and six-man units will be available later.

•

Saran-Lined Pumps: Dow Chemical's plastics sales division has announced that new, saran-lined centrifugal pumps are available through Saran Lined Pipe Co. (Ferndale, Mich.), distributor. The pumps have special rotary-type seals to eliminate high-friction heat failures, packing-gland leakage. Sizes: 1½ x 1 in. and 3 x 2 in.

CONSTRUCTION

Modernization: One production line at Goodrich-Gulf's Institute, W. Va., synthetic rubber plant will be converted to a cold rubber process. The engineering and construction contract has been awarded to The Girdler Co., division of National Cylinder Gas Co. (Louisville, Ky.). Girdler recently completed a $1.5-million steam power plant for GGC at Institute. The Institute plant is in the midst of a modernization program.

•

Coking Boost: Dominion Foundries and Steel, Ltd., will increase coke-making capacity 75% at its Hamilton, Ont., works, with the installation of 45 Koppers-Becker ovens having a carbonization capacity of 1,045 tons/day of coal. Koppers Co.'s Engineering and Construction Division (Pittsburgh) will design and erect the oven battery, install coke-handling and coal-preparation systems. Field work is in progress; construction will be completed early next year.



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CABLE ADDRESS—BROWNBILT

WITCO CHEMICALS AT WORK



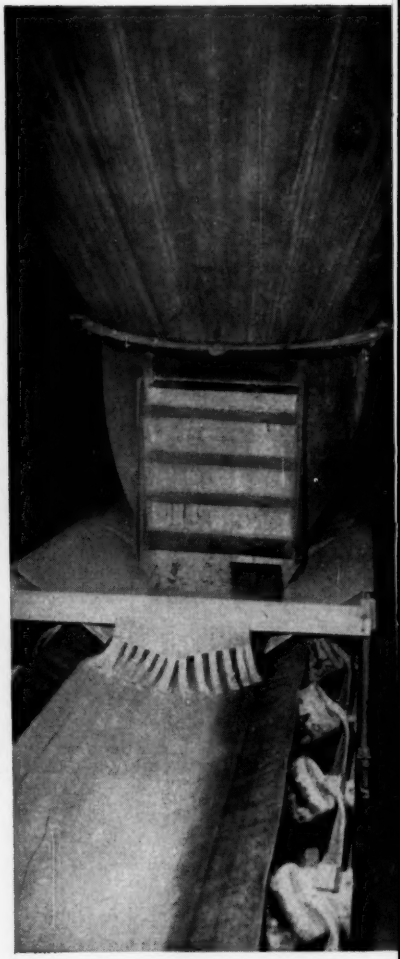
WETTER SPRAYS

Fine toxicant dispersion and thorough "wetting-out" after application insure top efficiency in insect and disease control. EMCOL® agricultural emulsifiers and wetting agents, used in pesticide formulations, are examples of Emulsol surfactants tailored to specific applications. Emulsol Chemical Division, Chicago, Ill.



STURDY CABLES

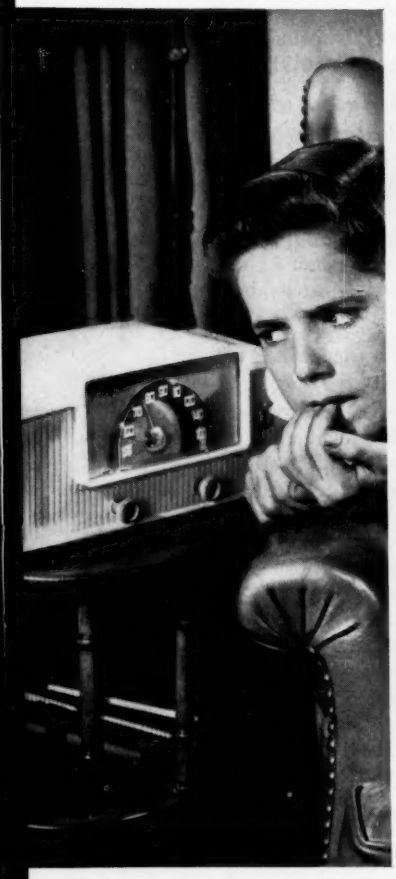
Coverings for electrical power cables on portable machines owe their extra toughness and abrasion resistance to rubber reinforced with carbon blacks such as CONTINEX® ISAF. A full range of channel and furnace blacks are made by WITCO-CONTINENTAL for rubber and pigment use. Continental Carbon Company, New York, N. Y.



DETERGENT BEADS

Countless millions of tiny hollow beads pour out hourly from ULTRA's modern multi-story automatic spray drier. Free-flowing and quick to dissolve, this new detergent form has found rapid acceptance in home and industry. A wide range of detergents and chemical specialties reflect ULTRA's ten years of experience in spray drying. Ultra Chemical Division, Paterson, N. J.

In Rubber, Plastics and Detergents, for example, Witco assures product performance



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As a mold parting film and as an internal lubricant for plastics, WITCO metallic stearates improve performance in injection molding and extrusion operations and insure fine-finish plastics, such as this radio case. WITCO stearates are manufactured in a great variety of types and grades for *every* industrial application.



"PARASOL" FOR RUBBER

Garden hose, and other rubber products subject to deterioration in sunlight, are now protected with WITCO's SUNOLITE® anti-suncheck-ing waxes. Incorporated before curing, SUNOLITES migrate at a controlled rate to the rubber surface to maintain a protective film.

The "little things that make the difference" are often small amounts of chemical additives that give new levels of service and appearance to old products and processes...and open the doors to new ones.

Chemicals from Witco and its divisions are adding new performance qualities to a widening range of products as a result of Witco's strong emphasis on developing the most suitable grades of chemicals for specific industry use.

Why not check with Witco? There may be a particular type or grade of chemical that will benefit *your* process or *product!*

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Helpful Answers to Caustic Questions

As a leading supplier of Caustic Soda, Columbia-Southern is asked many questions each month about this versatile "workhorse" alkali. While the answers probably are not completely new to every Caustic user, they do re-emphasize certain basic points that shouldn't be forgotten. We hope that you will find this series interesting and helpfully informative.

In how many different forms does Caustic come?

The four commonest forms of Caustic are anhydrous solid and flake (available in several particle sizes), and liquid concentrations of 50% and 73% strengths.

How can I determine my most economical Caustic buy?

So much depends on individual processing requirements that any flat answer might be misleading. The most important cost factors for your consideration are the purchase price of the material, transportation costs, unloading costs, labor costs for process handling, and investment cost of equipment required for unloading, storage and process handling. In general, equipment for handling solid or flake Caustic will be least costly, that required for 50% liquor next, and the equipment for handling 73% more expensive. Handling costs per ton of NaOH, however, will be in exactly the reverse order.

A more thorough way to get a clear cost picture of the best Caustic for your needs is to contact Columbia-Southern for the prompt services of our experienced Caustic Soda specialists. Just call, write or wire our Pittsburgh address . . . at no obligation, of course.

Is Caustic dangerous to handle?

Like most other chemicals, Caustic merits proper respect. Shipping improvements like the tank car dome platform (first standardized for all Caustic shipments by Columbia-Southern) have made unloading and initial handling much safer than in the past. As an elementary precaution, fast-valve showers and eye fountains should be readily accessible to all personnel who might come into contact with Caustic. Columbia-Southern will be happy to mail you copies of our up-to-date booklet, *Unloading and Handling Caustic Soda.* This handbook covers in detail such basic points as use of proper protective clothing, inspection of storage and piping facilities, tank car handling, steaming and dissolving procedures, complete stocking of First Aid cabinets, and the like.

Has Caustic Soda been used for a long time?

Caustic has one of the longest chemical pedigrees known. Various authorities agree in placing its earliest use among the Egyptians, who used the alkali in making cleansers. These ancient peoples produced Caustic, or lye, by utilizing the action of lime on solutions of plant ash sodas. Causticizing was effected cold, in the presence of a small amount of water, with the lye gradually separated by filtration through a cloth.

Is there more than one basic method of producing Caustic Soda today?

Yes. In the most popular electrolytic method, an electric current is passed through a sodium chloride brine solution contained in specially designed cells. Chlorine gas forms at the cell's anode, and a Caustic Soda solution collects at the cathode. This low concentration liquor is evaporated to yield the various commercial concentrations desired. The older lime-soda method of manufacture, not far removed in theory from the Egyptian process, utilizes the treatment of a soda ash solution with slaked lime. The resulting chemical reaction produces a weak Caustic Soda solution and a precipitate of Calcium Carbonate, which is filtered out. As in the electrolytic method, the Caustic solution is evaporated and purified to obtain commercial concentrations.

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IN CANADA: Standard Chemical Limited and its Commercial Chemicals Division

Washington
Newsletter

CHEMICAL WEEK
April 20, 1957

Chemical firms are joining a new tariff protection drive—one designed to pass legislation setting up import quotas for a wide range of commodities.

Among those already at work are fluorspar producers and other mining companies, textile firms, domestic oil companies, dairy and fish processors.

The proposal is to stop all imports of an item after they reach a specified percentage of annual domestic consumption. Discussion centers on a bill that would fix a limit for all imported products—say 15% to 33%—and then write exemptions that would set the quota limits for products that they want handled separately. Fluorspar producers say, for instance, that a quota of up to 75% of domestic consumption would be all right for metallurgical-grade spar, leaving them 25%, as long as acid-grade imports are limited to 25% of the domestic market.

The aim: passage of a bill next year, not in 1957. One reason: the opinion that nearness to the 1958 Congressional election enchances chance of success.

Pressure is being put on congressmen in breakfast meetings. And backers say they've already got 300 votes, in the House of Representatives, plus growing support in the Senate.

•

Chances of chemical additives law approval this year look slimmer. The Food & Drug Administration is putting all its effort behind this legislation—but the House Commerce Subcommittee on Health has decided to go through exhaustive hearings again. Committee members are planning to go slow, because industry and FDA are in conflict on important points; congressmen want to allow plenty of time to work out compromises if possible.

And, of course, approval by the House group would be only the first step on the long, long path a bill must take to get enacted into law.

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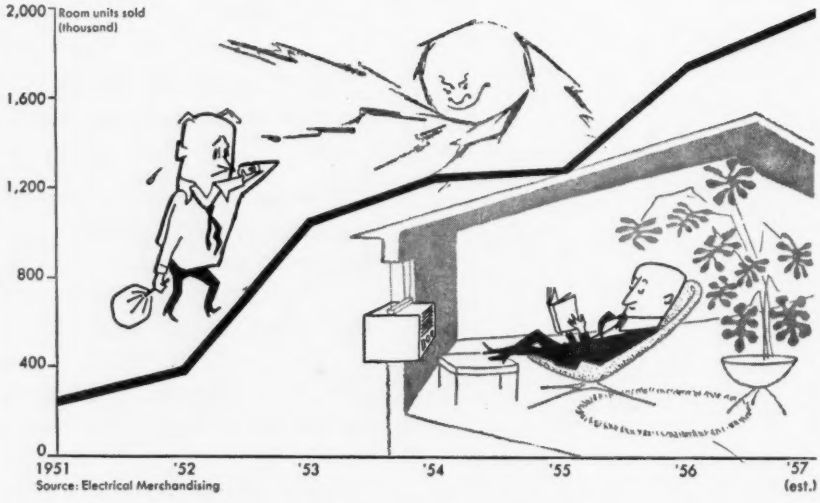
Niagara Frontier chemical firms went to the Senate to stress the area's power needs. R. Lindley Murray, president of Hooker Electrochemical, speaking for the Basic Industries Power Committee, told a Senate committee that construction of new power facilities in the area should get under way as soon as possible, since other areas are urging Niagara companies to either relocate plants or expand elsewhere.

The Senate Public Works Committee is considering whether the still-unused hydroelectric potential of the Niagara area should be developed by public or private power interests. Murray expressed no preference on this point.

Charting Business

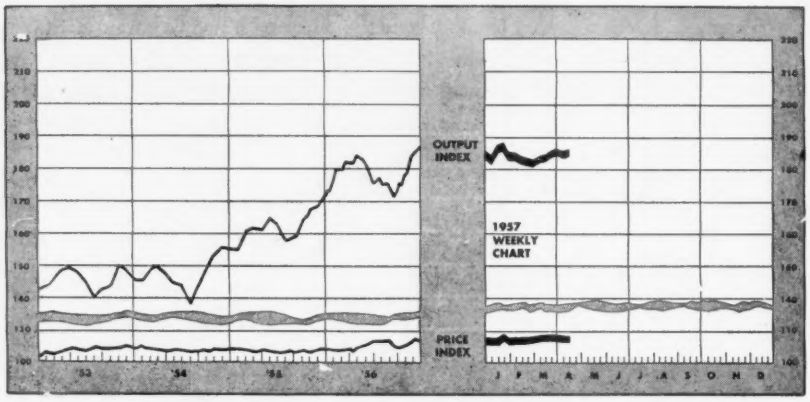
CHEMICAL WEEK
April 20, 1957

Air Conditioner Sales Gain



Conditioner Sales Bring Chemical Profit

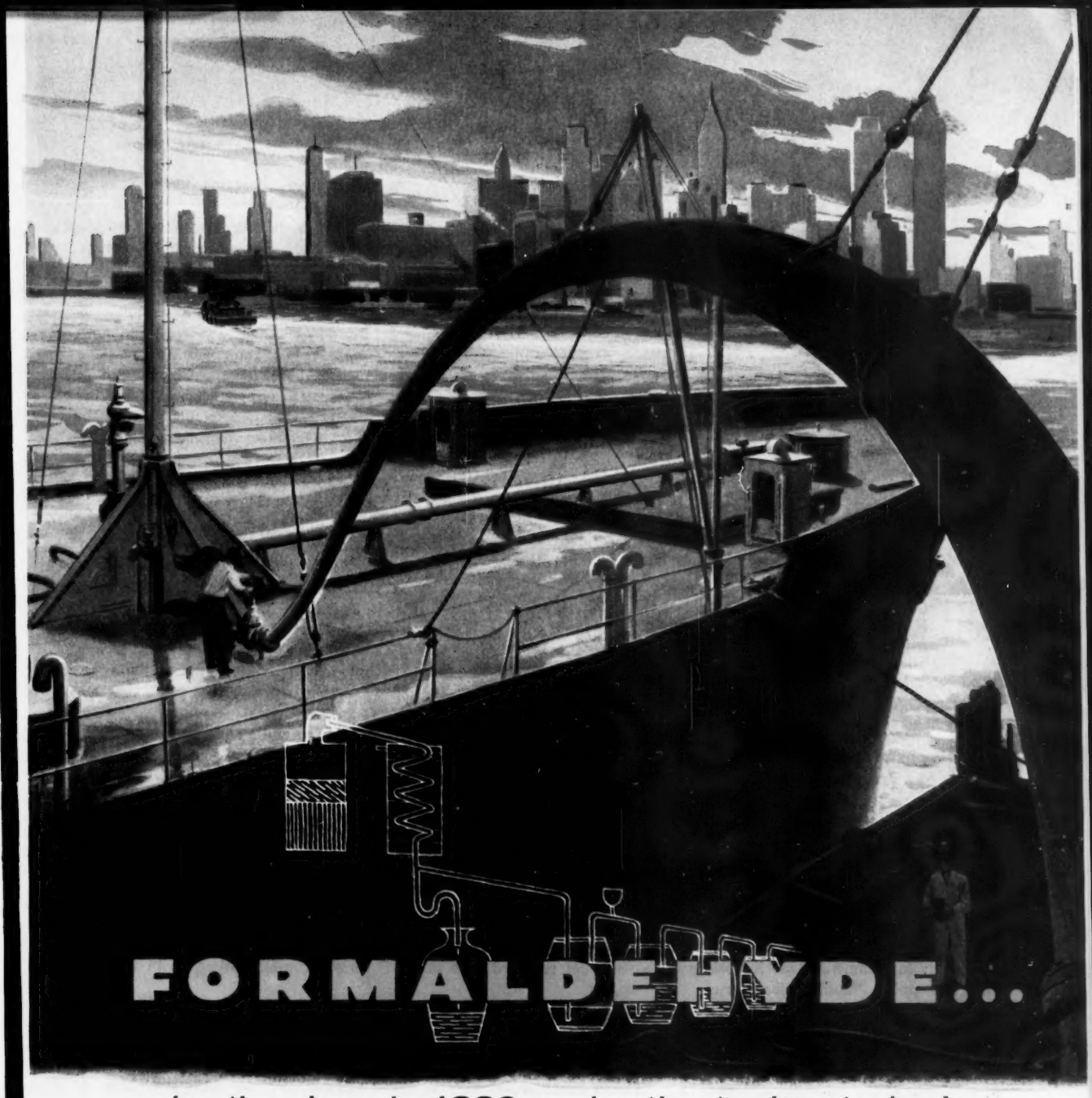
MANUFACTURERS of room air-conditioning units look for another sales peak this year—close to 2 million units should change hands. That would be a tenfold growth since '50. Chemical suppliers will also profit: air-conditioning units are big consumers of fluorinated hydrocarbons, high-melting-point tars, lubricants, paints, finishes, thinners, caulking compounds, reinforced plastics, glass-fiber insulation, adhesives. It's a growing, multimillion-dollar market.



Business Indicators

WEEKLY	Latest Week	Preceding Week	Year Ago
Chemical Week Output Index (1947-49=100)	186.6	186.3	183.5
Chemical Week Wholesale Price Index (1947=100)	110.0	108.6	105.7
Stock Price Index of 11 Chemical Companies (Standard & Poor's Corp.)	42.75	41.94	51.54

MONTHLY—Wholesale Prices (Index 1947-1949=100)	Latest Month	Preceding Month	Year Ago
All Commodities (Other than Farm and Foods)	125.4	125.0	121.0
Chemicals and Allied Products	108.8	108.8	106.5
Industrial Chemicals	122.9	123.2	120.0



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KILL COUNT: Microscope is used to count pests killed by ICI's Tetram 75.

Zeroing In on Mites

The nation's farmers may soon have some new weapons to use against mites, the tiny crop pests that have been wreaking havoc on cotton and citrus and deciduous fruits. Tetram 75, Imperial Chemical Industries' tradename* for its long-in-testing R6199 (*CW, Nov. 5, '55, p. 57*), seems ready to go commercial. (For news of another new pesticide, see box below.)

Already in commercial use in Holland (on apples), South Africa (citrus and apples) and England (apples), the new organic phosphate compound has received temporary tolerance (0.05 ppm.) for use on cotton in the U.S., may eventually get a permanent tolerance permitting unrestricted use on cotton. Chipman Chemical (Bound Brook, N.J.) will distribute the compound in this country.

Here are some of the claims made for the new mite killer:

- It's long-lasting. Only one spraying is required in a season.
- It's effective in low concentrations. As little as 2 oz. (75% active ingredient) clears up the mite problem for an acre of fruit or cotton. Typical dosage of other miticides: 8 oz./acre or more.
- It can be used at high concentrations or low. The 2-oz. dosage can be mixed in 2 gal. of water for aerial application to cotton, or in 2,500 gal. of water to spray fully grown citrus trees.
- It does not kill the natural enemies of mites. (Because standard postwar insecticides removed mite predators, mites became an economic problem.)

Tetram has certain disadvantages, too. Its first cost is high (ICI, however, says use cost makes it competitive with other miticides), and is more toxic to mammals than parathion (although in use dosages, hazard is about the same as that of parathion). And, experiments on the Pacific Coast indicate, Tetram is involved in a problem affecting other phosphate miticides—the mites appear to be developing resistance to it.

Nervous Breakdown: Though Tetram is a contact insect poison, its action in the plant is systemic. When sprayed on plants, it is absorbed into the plant fluids, translocated throughout the plant; thus, it can kill pests coming into contact with any part of the plant. Like most organophosphates [Tetram is 0,0-diethyl-S-(β diethylamino) ethylphosphorothiolate hydrogen oxalate], it poisons the pest's nervous system.

The potential for an effective miticide is large, and still growing. Miticides now account for about $20 million/year in sales.

ICI figures the potential market for its product lies in the 808,000 acres of lemons, oranges and grapefruit in the U.S., pegs the cotton-field potential at 17.5 million acres. ICI's Plant Protection Ltd. group is now the sole manufacturer of the product sold through various firms associated with ICI.

*Other tradenames: Metramac in Sweden, Norway, New Zealand, South Africa, Japan, Mexico; I.C.I. Amiton in Holland; Inferno in Italy; Tetram in the United Kingdom. All are identical products containing 75% active agent.

Hercules Readies Its Entry

Almost simultaneous with the announcement of Tetram 75, has come word from Hercules Powder that, following thorough testing (*CW, Nov. 5, '55, p. 57*), it is making commercially available its Hercules 528 pesticide. The chemical, tradenamed Navadel, is reported to be extremely effective in controlling a wide range of crop pests, have good residual killing power.

Like Tetram 75, Navadel is recommended for use on cotton, citrus and deciduous fruits. It's also useful on grapes, vegetables and ornamentals, as well as in helping control cattle ticks.

Chemically the dithiophosphate of dioxane, the material is lethal to leafhoppers, thrips, leaf miners and mites of various types. Especially noteworthy is its ability to destroy the eggs of mites as well as the adults.

The pesticide will be available this year for use in either dusts or sprays. It should be used—depending on application method and type of insect attacked—in a range of ¼ to ½ lb. of material per acre.

Degree of toxicity to warm-blooded animals is said to be lower in Navadel than in most phosphate insecticides now on the market.



fish

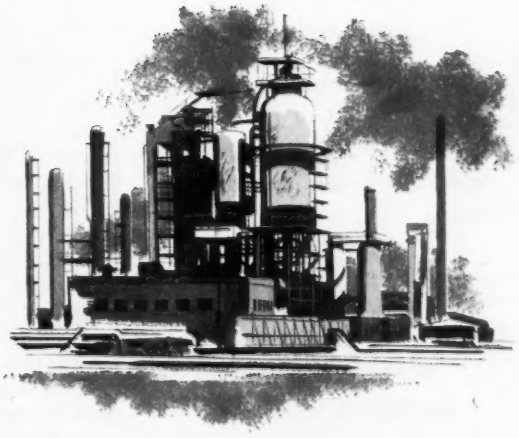
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Where Does 'Fair Trade' Stand Today?

- **Three states and District of Columbia have never passed fair-trade laws:**

  Missouri Texas Vermont

- **High courts of eight states have ruled 'nonsigner' clauses invalid:**

  Arkansas Colorado* Florida Georgia
  Louisiana* Michigan Oregon* Utah*
  (many lawyers think whole law has been thrown out in Utah)

- **High courts of two states have ruled entire law invalid:**

  Nebraska Virginia*

- **Anti-fair-trade rulings by lower courts are pending before high courts in four states:**

  Arizona Indiana Kentucky South Carolina

- **High courts have ruled in favor of fair trade in 16 states:**

  California Iowa New Jersey South Dakota
  Connecticut Maryland New York Tennessee
  Delaware Mississippi North Carolina Washington
  Illinois Massachusetts Pennsylvania Wisconsin

- **The other 15 states have fair-trade laws that have never been tested in a court.**

(*marks 1956 actions)

Fair Future for 'Fair Trade'?

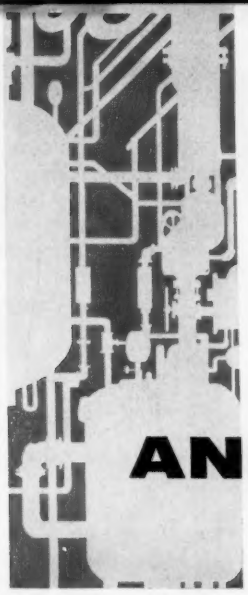
"Fair trade," which is the subject of many obituaries, will try for a comeback next year. The Bureau of Education on Fair Trade (New York) is now preparing a bill that would give the principals of fair trade greater strength than they've ever enjoyed. The group hopes to have the bill put before Congress in '58.

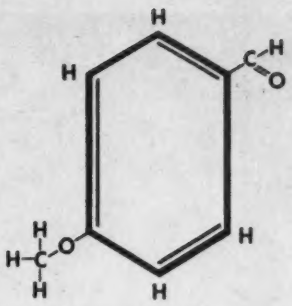
Details of the proposed law and how it would work haven't been released yet, but essentially it would permit any manufacturer with an "identifiable" product to set a firm retail price for it. No signing of contracts with retailers would be necessary, thus doing away with worrying about "nonsigner" clauses (which force all retailers in the state to hold to the fair-trade price if one retailer signs).

In effect, the bill would take fair trade out of the hands of state governments and force all retailers in the country to adhere to the price set by the manufacturer.

Abandon Ship: Fair-trade forces intend to throw all their strength behind the new bill; it could well be their last chance for survival. Court decisions the past few years have left fair trade inoperative in 14 states (*above*). Partly because of the enforcement problems created by this spotty legal situation, some of fair trade's most stalwart supporters have dropped out. In 1955, Westinghouse Electric quit, and this year Eastman Kodak followed.

Proponents of fair trade claim that defections like Kodak's have been offset by new converts, most notably the oil companies. A number of oil companies have been trying fair trade in an effort to halt gasoline price wars on





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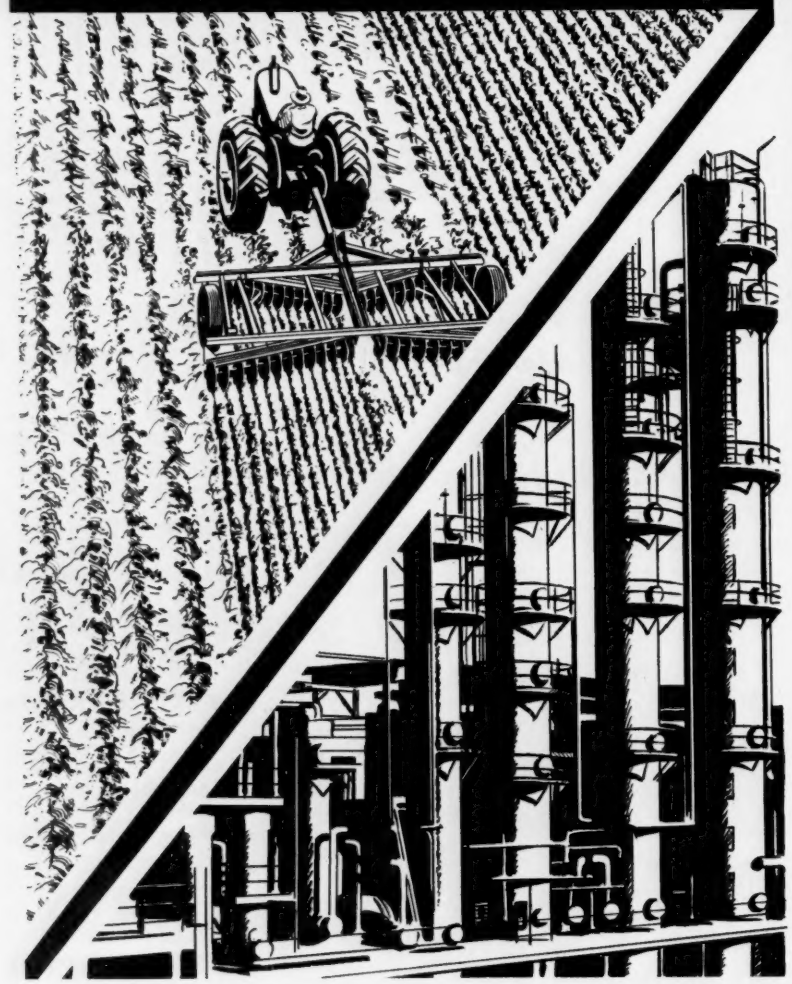


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the Eastern seaboard. Now, however, after almost a year of fair trade, some are giving it up. Indications are that many fair-trade supporters favor an end to it, at least until fair trade gets on firmer ground.

Since price competition is usually as strong between dealers handling rival brands of gasoline as between those with the same brand (consumer brand-preference in gasolines being weak), fair trade isn't very effective unless all oil companies in a community practice it. This creates a situation that, if not illegal, is at least suspicious-looking. It could lead to public — possibly government — reaction against both the oil companies and fair trade.

Stamped Out: Forces in favor of fair trade are generally aligning themselves against stamp plans. Reason: stamps have been used effectively by some fair-trade foes in legal actions. Recently, a New Jersey discounter known as Two Guys from Harrison lost a case in which its defense was that the fair-traders weren't prosecuting other retailers who, in effect, cut prices by giving out trading stamps. When the judge ruled that trading stamps weren't in violation of fair-trade laws, Two Guys inaugurated a plan whereby it issues stamps that are immediately redeemable for cash.

Colgate now has a suit pending against three North Carolina supermarkets, charging them with violating state fair-trade laws by giving trading stamps with purchases of Colgate toiletries.

The final answer in the fair-trade question is expected to come from the Supreme Court. In 1951, it ruled that the Miller-Tydings Act (which permitted states to pass fair-trade laws) did not apply to nonsigners. The McGuire Act changed that, and the high court has since refused to review any lower-court fair-trade decisions. Federal courts have eight times upheld the constitutionality of the McGuire Act, and denied it once; each time the Supreme Court has let the decision stand, by refusing to review.

It is felt by most people concerned, though, that the court will have to take a stand on the issue soon. When it does, it is bound to have a powerful effect on fair trade—whether or not Congress okays the proposal it will get from the Bureau of Education on Fair Trade.



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SHOESHINE BOY: He's a vanishing market for polish makers.

Eighty-Million-Dollar Shine

Three shoe-shining products just now hitting the market emphasize once again the trend that all chemical specialties should remember: the consumer, in looking for a product that's more convenient to use, will willingly pay a premium price for it.

These products illustrate the trend: Valay-Shine, made by the Valay Co. (Columbus, O.), packaged in a metal container similar to a giant lipstick tube and priced at 39¢. Shoe-Shine by Renuzit Home Products (Philadelphia), an aerosol-applied liquid polish; a 6-oz. container sells for 79¢. Esquire Lano-Wax, a self-shining liquid wax selling for 25¢ per 2-oz. bottle.

These products have one thing in common: they stress ease of application. Too, they are not aimed at the small—and vanishing—entrepreneur who operates a shoeshine business, but at the consumer who shines his own shoes.

CW talked with manufacturers of shoe polishes, wax makers and importers, and government agencies, to delineate the future trends in the shoe polish industry—whose retail sales may soon be approaching the $100-million/year level.

How Big: Exact estimates vary all over the lot as to how much the total U.S. yearly retail sales volume is for all types of shoe polishes. The figures reported by those companies having the most extensive market research facilities, however, are in the neighborhood of $80-85 million.

Sharing this market are Knomark Mfg. (biggest both unitwise and dollarwise), producer of the Esquire line; American Home Products, with its Griffin line; Best Foods, with Shinola; Kiwi's American Division's Kiwi; Cavalier Co.; and Whittemore Bros., a subsidiary of Recipe Foods. There are a number of small companies that do well regionally. In the lineup above, Knomark and Kiwi are the fastest growing. Whittemore, on the other hand, appears to have lost more of its share of the market than any of the others in the last 10 years.

Eastern Concentration: Most polish manufacturers are centralized in the East, where the population is concentrated. Such a location is closer to raw materials and packaging supplies. Shipping is not much of a problem (many ship west via the Panama Canal). Furthermore, Western costs of raw material, packaging, and labor are substantially higher than in the East. For example, cartons cost 15% more on the West Coast than on the East.

Among the national brands, Cavalier has a plant on the West Coast (at Oakland, Calif.), but this is a relatively small operation. John Lincoln Co. of San Francisco is the largest Western maker. Wilco Co. (Los Angeles), which does a lot of private label manufacturing, is a big factor on the West Coast, as are Angelus Co. and Omega Co. (both also of Los Angeles).

Barton of St. Louis is a big Midwest producer, but its output is small compared with that of Best Foods' big Indianapolis plant. In the South, the biggest operation is the Whittemore plant in Fayette, Ala.

Total sales are divided into three main areas that are roughly equal, dollarwise: paste (most), liquids, including creams (slightly less) and whites (least).* Retail price of 15¢ a tin is set for about 45% of the pastes, 25¢ for about 50%, more for the rest. A change is ahead, however. Fifteen-centers will likely hop to 25¢, and the 25-centers go higher—as one already has. In 1939, the 10¢ can represented

*Boot and Shoe Recorder magazine, in a survey of shoe store polish sales last month, found customer preference in these outlets to be: paste 42.3%, liquid 35.5%, cream 20.3% and spray 1.9%. Products priced between 15 and 30¢ accounted for 91% of sales; those between 30 and 55¢, 8.9%; over 55¢, 0.09%; and between 10 and 15¢, 0.001%.

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Manufacturing Affiliate of **CHAS. L. HUISKING & CO., INC.**

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90% of industry's sales, with 25¢ cans accounting for the rest.

Liquids appear to be fairly stable in price, will probably stay at the 25¢ mark—for 2 oz.—at least for a while. White polishes (mostly liquids) will likely all be 25¢ soon.

Aerosols (which account for something like 1-2% of the market at present) retail at from 69¢ to $1.49.

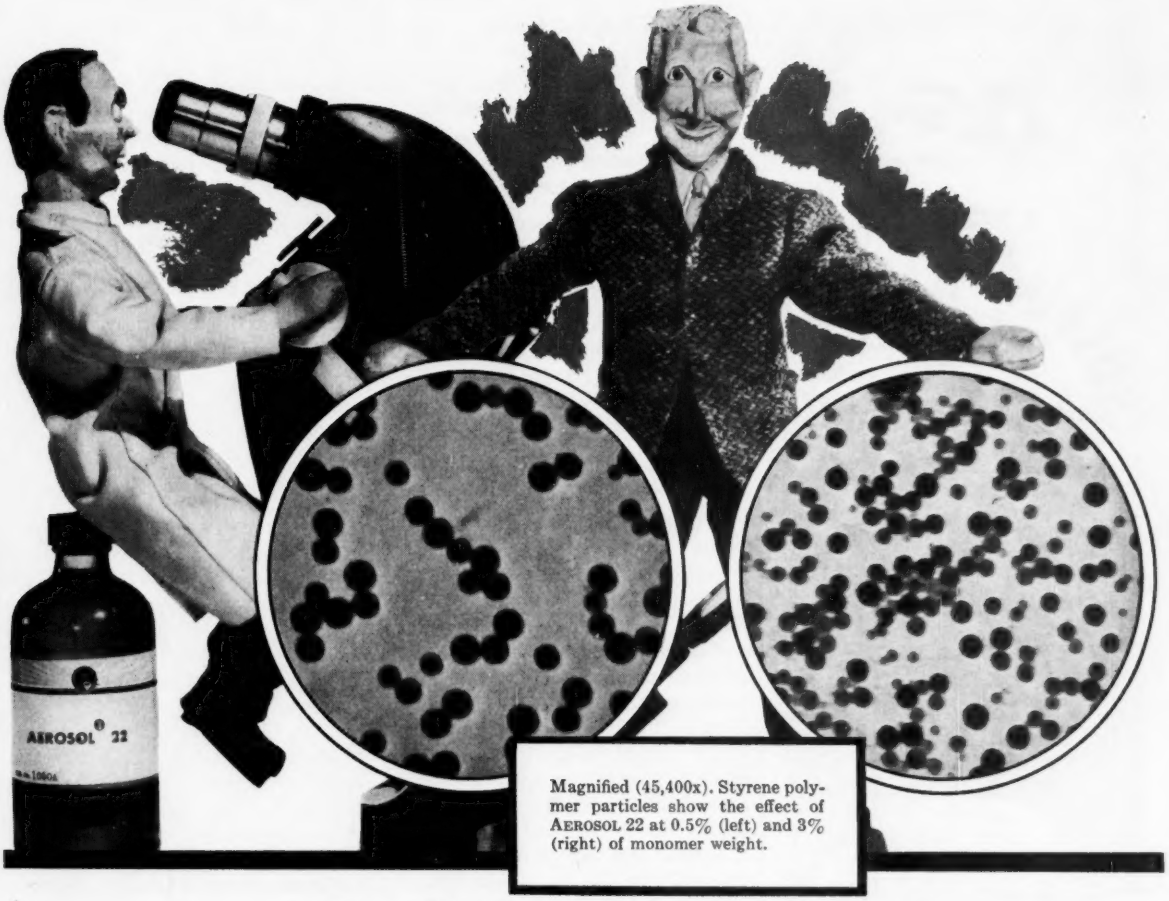
Biggest factor in rising polish prices is not cost of raw material, but freight (about 15% of selling cost now), selling costs, and fringes.

Black Is the Color . . . : Most popular color at present is black, followed closely by brown. Two of the reasons for bigger sales of black lately are the Army's shift to black shoes, and the growth in popularity of the "Ivy" look. Since World War II, too, the shoe industry has been promoting various new shoe colors, has done well with various golden shades, charcoal, rusts, etc., both in high-style and in low-priced lines. This, of course, calls for a wider number of special cleaners and waxes.

Stains, which differ chiefly from polish in that they contain higher percentages of dyes, have become more popular since the war, are said by some to have gotten their boost from service men who were anxious to quickly get color into the shoes issued them. Also, the stains did a better job of covering scuffs.

Probably the most surprising color change is the switch of white from a seasonal to an all-year-round product. Though summer is still the peak season for whites, several factors have helped level out this peak. Among them: the increased birthrate (baby shoes are big consumers of white), and the decline in popularity of white shoes for summer wear. Prior to '47, clay and zinc compounds were the chief pigments used for white polish. Since that time, titanium dioxide has come into increasing use, is a distinctly superior whitener. White pastes and creams do a better job of whitening than liquids, but ease in application of the liquids makes them the overwhelming consumer favorite. There's this too: even though application cost, in terms of amount of whitening used per application, is higher for the liquid types, the lower cost of the package gives the user the feeling that the liquid is more economical.

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Magnified (45,400x). Styrene polymer particles show the effect of AEROSOL 22 at 0.5% (left) and 3% (right) of monomer weight.

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In addition to presenting the general properties, Cyanamid's new technical bulletin, AEROSOL *Surface Active Agents*, gives formulas and procedures for the polymerization of styrene, vinyl chloride, vinyl acetate and other vinyl monomers. A copy will be sent to you on request.

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might be expected, women buy most shoe polish. Next, their children, who are sent to the store to buy it. Men buy the least of all. Men use the most paste polish; women are the best market for liquid polish; young children use up most of the liquid. Age is a factor too: older people want to do the job with a minimum of bending; the college set want perfection in

Shoe Polish Exports—a Plus for Profits

U.S. makers of shoe polish have long found exports a lucrative business. And of the exports, two of the important markets for U.S. makers are the country's northern and southern neighbors—Canada and Mexico. But the picture is changing in both countries as domestic competition increases. Here's what the sales situation is north and south of the border.

In Mexico—

It's important to remember, in discussing the shoe polish business in Mexico, that only about 40% of the Mexicans wear shoes that can be shined. The remaining 60% wear huaraches or go barefoot. (As a matter of fact, one of the accepted measurements of the degree of civilization of Mexico's countless isolated communities is whether the local citizenry wear shoes.) Thus the per-capita market in Mexico isn't comparable to that in colder, more developed nations.

Biggest Mexican producers of polish are Zapata Hermanos and El Oso, both of Mexico City. Zapata Hermanos, which is primarily a local manufacturer for the U. S. Crown Cork Co., today produces about 20,000 1-oz. tins (selling for 5¢) and approximately 8,000 4-oz. tins of polish (12¢) each day. In addition, about 45,000 small bottles of a shoe cleaner and stainer are produced daily.

Zapata uses carnauba wax (bought direct and via New York) and domestic natural waxes such as candelilla or beeswax. It obtains coloring from Germany and the U. S., does not use lanolin or silicones.

El Oso S. A. still operates under Prisciliano Perez, who started the company in 1919. Today his 30 workers turn out a total of 10,000 tins a day of 1- and 4-oz. content. El Oso uses lanolin and silicones as well as the conventional wax ingredient.

Both El Oso and Zapata Hermanos say business improves 10% yearly.

But they have some distance to go: there's more U. S. polish sold (via Sears, Woolworth's, others) in Mexico than of other foreign or local brands despite a more than 100% ad valorem tax on shoe polish imports.

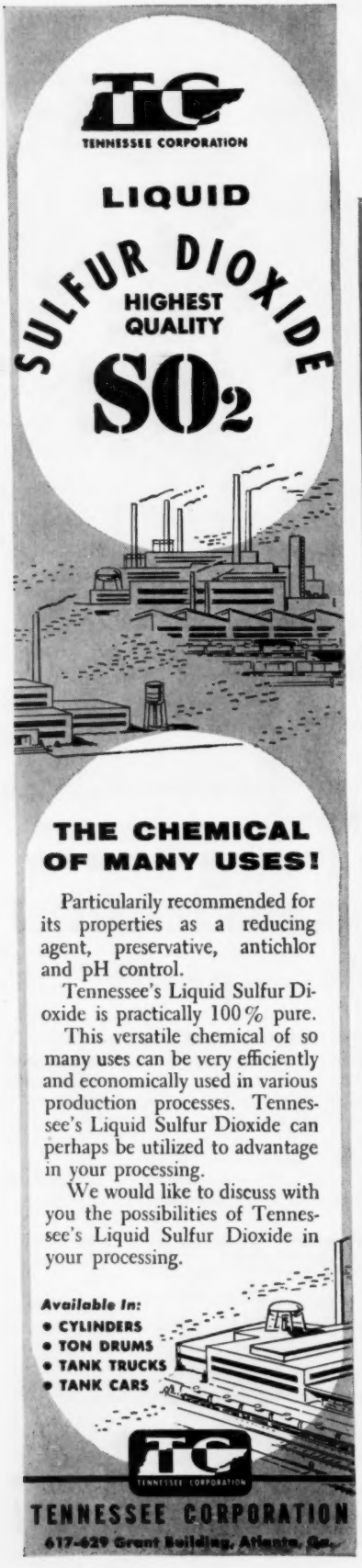
In Canada—

The main problem of the Canadian manufacturer is meeting the stiff competition from imports. Although the domestic manufacturer has a 17½% tariff protection from U. S. imports, most of his essential raw materials have to be imported and are dutiable at around 22½%. Naturally, too, the Canadian manufacturer cannot attain the large-scale unit production economies enjoyed by U.S. plants.

Probably the biggest single complaint of the Canadian manufacturer, however, is the free (or, at least relatively inexpensive) Canadian audience available to the big U. S. polish manufacturer who advertises on television. Domestic manufacturers claim they cannot afford to advertise on Canadian TV channels, let alone the U. S. channels that are most popular with Canadian audiences.

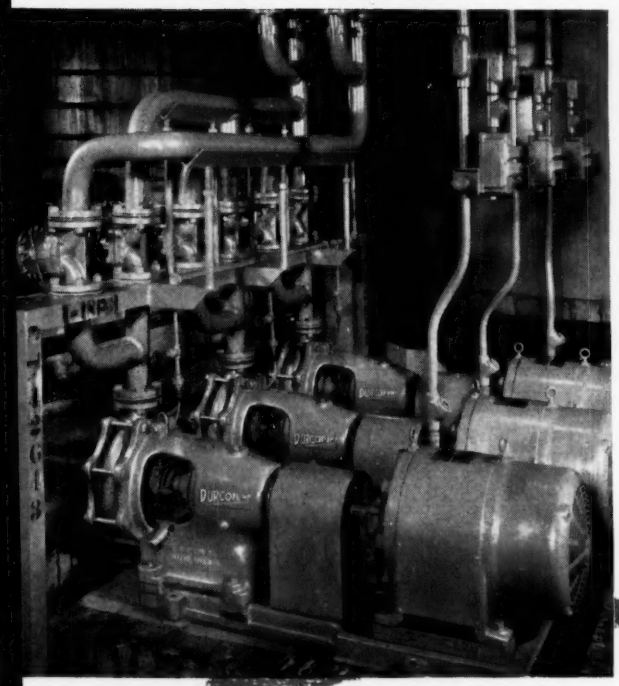
Chief shoe polish manufacturers in Canada: the "It" Company (Toronto), Best Foods (Canada) Ltd. and Kiwi Polish Co. (Canada), both of Hamilton, Ont., and Nugget Products of Canada, Montreal, Que. Also a factor is Beaver Products Ltd., of Montreal.

Canadian polish makers feel there are no really accurate statistics available on their industry. The best—and only—figures are those prepared by the Dominion Bureau of Statistics. Latest DBS figures (for '55) show value of factory shipments of shoe polishes and dressings as $1,120,399. This figure was called "too low" by A. A. Dodge, the president of It, who added that '56 figures are up at least 10% over '55. The same DBS study pegs '55 imports (about 85% from U.S.) at $819,966 (up from $571,243 in '54, $412,044 in '53).



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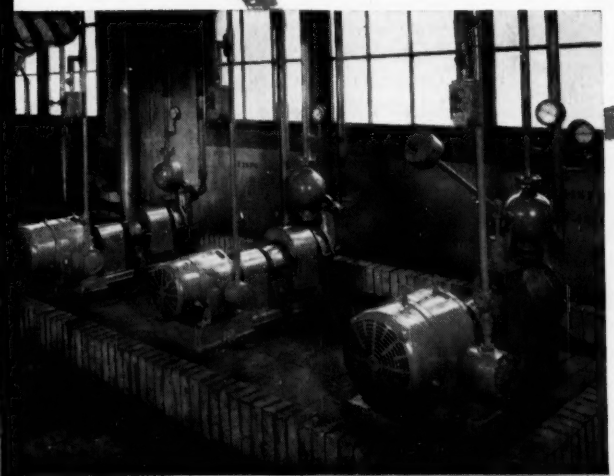
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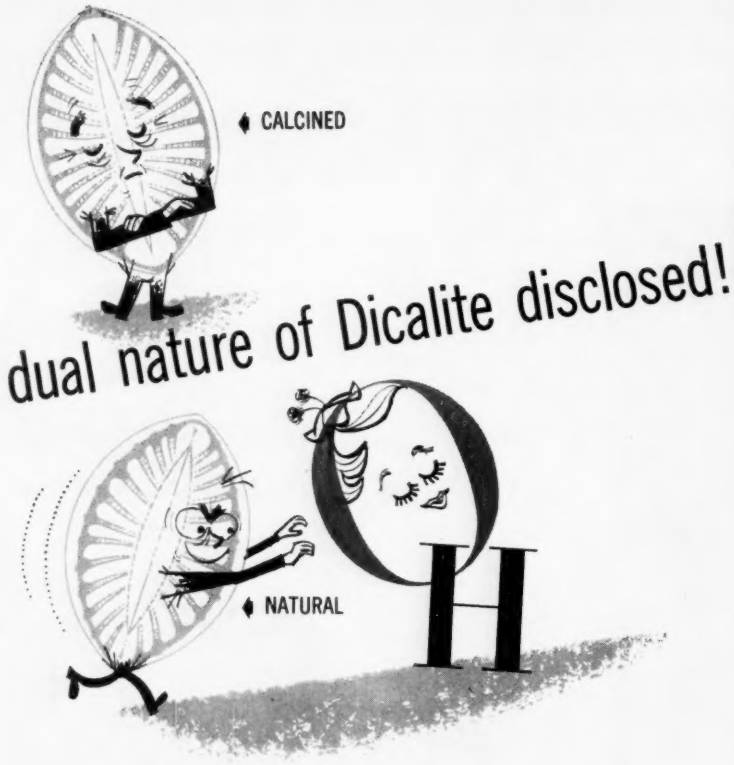
The Bound Brook plant of American Cyanamid Company is a primary source of pharmaceuticals, dyestuffs, pigments, rubber chemicals, intermediates, and other products for the chemical processing industry. They use Durcopumps for their process pumps.

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shine, fuss with polishes even more than necessary.

Aerosols are not considered a threat to traditional markets by most wax makers. Seen slowing their growth are the unevenness of application, the difficulty of controlling spray, and the difficulty of getting good polish ingredients in the pressure containers. The chance of staining will also slow up aerosol products: few people would want to take the chance of spraying stain around where it could get on furniture, clothing, etc. Best chance for aerosol products probably lies in suede and other rough-textured shoes, which are a bother to clean with present products.

Top retail outlet for polishes are grocery stores (about 40%), followed by shoe stores, department stores and shoe repair establishments. Dime stores are next. The fastest-growing retail outlet is the shoe store. (Big sellers here are Esquire, Cavalier, which sells to them exclusively, and Kiwi.) There are about 50,000 shoe stores selling polish. Major credit for shoe store sales of polish (up from a low of 5% of total sales in the early '40s) undoubtedly goes to Knomark, which originally operated exclusively via this outlet, did a vigorous job of turning shoe salesmen to polish-pushers as well.

The shoe repair store (down in total number from 40,000 to 25,000 in 1948) is becoming less and less a factor in shoe polish sales, as are the shoe shine parlor and lone-wolf shoe shine boy.

What's in It: U.S. polish formulations haven't changed much over the last couple of decades. Pastes still consist of waxes, solvents, dyestuffs, oil and additives. Probably the biggest trend in formulating is toward making paste wax that won't shrink in the can. A big market has been created in this area for Fischer-Tropsch mineral waxes such as Duroxon R-11. Also increasing in popularity are the "mirror finish" polishes using the Gersthofen waxes made by Hoechst (Germany).

Lanolin, according to most polish formulators, is a gimmick for advertising purposes; if enough lanolin is added to exert any beneficial softening effect, a shine would be impossible because of the resulting high grease content of the polish. Polish makers



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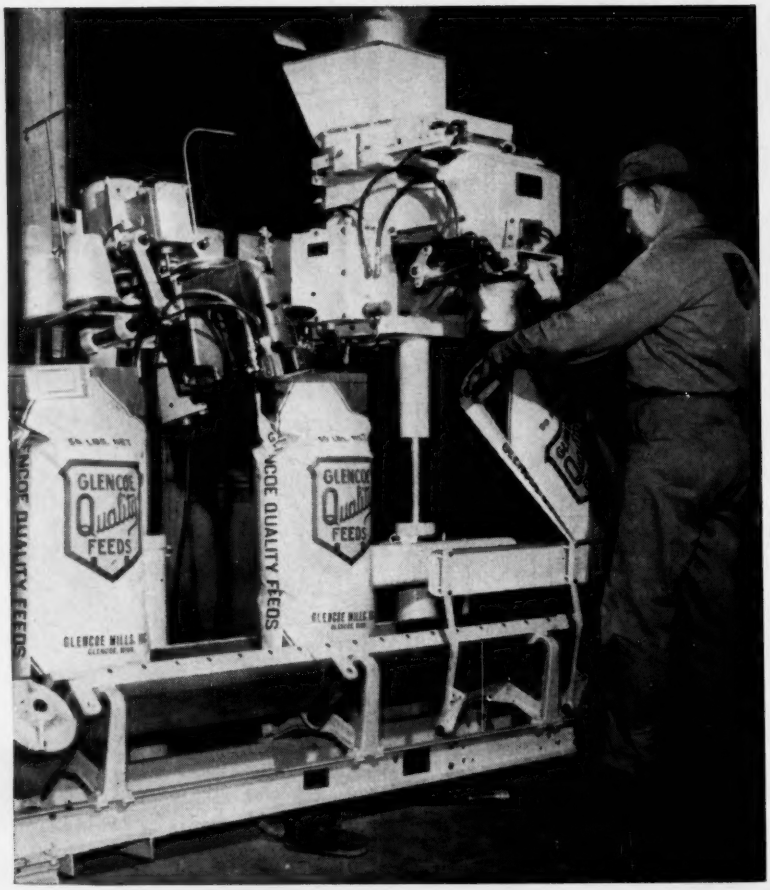
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BEMIS VICON® FEEDER—A unique means of moving products from supply hopper to scale beam; a two-stage pulsating feeder tray first feeds rapidly, then at a rate which can be controlled for accuracy. When the exact weight is reached, the feeder cuts off and the filled bag is deposited automatically on the sewing machine conveyor.

CAPACITIES—From 25 lbs. to 150 lbs. Easily adjustable for varying bag sizes.

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NO INSTALLATION SERVICE—Just move it in and plug into a 110-volt, 60-cycle line. All electrical equipment enclosed in cast-iron explosion-proof boxes.

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SPECIALTIES

who incorporate lanolin are exploiting the consumer's thought that what's good for human skin must be good for shoe leather, too.

There's more use of silicones in polish (Whittemore, for example, will soon bring out a liquid, Dux Bak, using silicones). Though most formulators agree the silicones provide better water repellency, some complain of its lack of compatibility with other polish ingredients and of the expense of putting an effective amount of this high-priced material into a low-priced item like polish.

Carnauba wax (from Brazil), despite widely fluctuating prices, still continues —along with candelilla (from Mexico), montan wax (from Germany) and esparto wax (also from Brazil)—to be important in compounding shoe waxes. Sugar cane wax, gaining popularity, is used as an extender for carnauba, as is the domestically produced microcrystalline wax.

Most wax makers would be willing to purchase a domestically manufactured product—even at a higher price —to replace carnauba, so far unmatched as a polish wax. But few think there's any likelihood of getting such a product in the foreseeable future.

PRODUCTS

Hot Lube: A new high-temperature plug valve lubricant, Molylube No. 80, can be used in temperatures up to 750 F, says its maker (Bel-Ray Co., Inc., Madison, N.J.). The lube is a nonmelting grease containing molybdenum disulfide. The company claims that it will not affect rubber, will not melt and is insoluble in water.

•

White Way: The German firm Dr. F. Raschig GmbH. (Ludwigshafen) has developed a white asphalt for coating roads. The asphalt can be coated at 338 F as a liquid and is ready on hardening. It is unaffected by dirt, is durable for years, according to the company.

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Save Rubber: A preservative called Stop-Dal is designed to protect rubber from becoming hard, porous and brittle through the action of oxygen and ozone. It was developed by the German firm Reiner Chemie Hans Reiner KG (Rodenbach-Kaiserslautern).



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Description and application

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Detergent Intermediate

The world's leading intermediate for the manufacture of synthetic detergents. Alkane is an alkyl aromatic synthesized from petroleum hydrocarbons and is readily converted to surface active agents, both dry and liquid, of the highest quality and purity.

Converting Oronite Alkane into commercial or household detergent products involves the application of standard sulfonation and neutralization reactions, which often can be accomplished with available process equipment. Oronite can supply technical advice and complete information on the building or adapting of existing plants for the processing of Alkane. This service includes drawings, flow diagrams and suggested plant equipment as well as technical service on plant operation and product control. Write for technical bulletin giving you the complete Alkane story.

*TRADEMARK ORONITE CHEMICAL COMPANY

SURFACE ACTIVE AGENTS

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Dispersants NI-E—NI-O—NI-W. NI-E is an oil-soluble, liquid nonionic of the alkylphenyl polyethoxyethanol type used in the formulation of dry cleaning detergents and for general emulsification applications where a water-in-oil type emulsifier is required. NI-O is slightly more hydrophyllic than NI-E and has similar application. NI-W, also a liquid nonionic, is used for compounding heavy duty household and industrial detergents, liquid dishwashing products, metal cleaners, sanitizers, rug cleaning, textile and leather processing compounds, agricultural chemicals, insecticides, polishes and cosmetics.

Wetting Agent "S". Paste-form surface active agent used in emulsion type weed-killing products. Also effective in washing rugs, upholstery, in processing fruits and vegetables, in preparing liquid cleaners or wherever a paste type product is desired. Qualifies under A.S.T.M. specifications as an air entraining admixture for concrete.

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The spectacular star on the chemical frontier—possibly the most important new raw material for the protective coating and plastics industries in the past half century. Already scores of manufacturers have found Isophthalic offers properties and cost advantages heretofore unobtainable.

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Oronite manufactures a complete and versatile line of odorants to meet all safety requirements of the natural and liquefied petroleum gas industries, and to cover all types of odorizing needs. Since marketing of the first gas odorant in 1927, Oronite has been a major producer and leader in the field. Oronite odorants include: *Calodorant® C*, a completely stable cyclic sulfide odorant; *Calodorant® C Special*, blend of Calodorant C and solvent; *Calodorant® B-1*, a sulfide odorant at a mercaptan price; *Alert® 80*, best economy-priced, quality mercaptan odorant; *Ethyl Mercaptan*, a high quality pure mercaptan for LP gas; *LPG Odorant*, tailor-made from a selected mercaptan cut.

Do you have a copy of Oronite's new 36 page Gas Odorant technical bulletin? Send for one.

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Fuel Oil Additives. Mixed with diesel, furnace and jet oil fuels to stabilize against deterioration, sludge formation and for preventing corrosion in presence of water.

Maleic Anhydride. White crystalline product used in manufacture of synthetic resins, paints, dyes and plastics.

Metallic Naphthenates. Used as preservatives for cellulose products against attacks of bacteria, fungi, wood parasites and marine organisms.

Hydrogenation Catalyst. Used in de-sulfurization process to remove sulfur, nitrogen and metals from petroleum feed stocks.

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SALESMAN MIDDLING rarely exerts himself. **SALESMAN BEAVER** usually gives his 'all'.

CW Report

by John W. Barry

Motivation Makes the Difference

Well-drawn incentive payment plans can go a long way toward energizing chemical company sales forces, orienting sales efforts toward targets set by management.

Despite the fact that an estimated 90% of all American salesmen are paid—in part, at least—on an incentive basis, a surprising number of chemical industry salesmen are still working for straight salary.

And of the sales incentive plans that do exist in the chemical industries, only a handful are accurately targeted toward management's objectives or properly geared to the selling job.

This is hard to understand in the light of these observations:

- The chemical salesman who is paid by incentive tends to give his "all" to the selling job. And this kind of motivated selling is what management should be seeking, especially these days.
- In any given sector of the chemical industry, the firms that rank high in sales usually have well-devised incentive plans for salesmen.

What is a sound incentive plan and how can sales management determine whether a company needs one?

Answers to the following eight questions will help you decide whether your company needs an incentive plan:

(1) Customer by customer, is the company gaining ground in its share of business obtained?

(2) Do salesmen pay enough attention to nonselling tasks?

(3) Are company salesmen giving their "all" to the sales job?

Perking or Plodding?

Sales managers can measure the success or failure of their present compensation programs by answering these eight questions:



1. **Customer by customer, are you gaining or losing sales ground in share of business obtained?**



5. **Are your salesmen spending too much time with the wrong people?**



6. **Do your salesmen remember to cultivate production personnel?**



7. **Are your salesmen working toward their own or the company's ends?**

(4) Are salesmen hanging on until they get the order?

(5) Are salesmen remembering to cultivate production people whose opinion might, in close decisions, clinch the sale?

(6) Are salesmen spending too much valuable time calling on the wrong people?

(7) Are salesmen "lone wolves" working toward their own ends or company men striving for management's goals?

(8) Is the company losing good salesmen to competitors?

Negative answers to the first five questions and positive responses to the last three suggest the need for an incentive compensation plan.

A good sales incentive plan should:

(1) Be simple.

(2) Provide a base salary sufficient to free salesmen from serious money worries.

(3) Give salesmen strong incentive to increase sales along lines specified by management; salesmen should be discouraged from acting on their own ideas of what needs pushing.

(4) Provide salesmen with realistic incentives to perform responsibilities other than those connected with selling.



2. **Are your salesmen conscientiously performing nonselling tasks also?**



3. **Are your salesmen giving their "all"?**



4. **Do your salesmen hang on until they get orders?**



8. **Are you losing good salesmen to competitors?**

(5) Keep sales costs within reasonable pre-established limits.

(6) Give salesmen a steady total income, one that doesn't fluctuate radically from year to year.

(7) Be easy to administer.

Sales executives should also remember that incentive plans for salesmen will vary from company to company. Each plan must be custom-tailored to fit specific needs.

Sales Resistance

One very familiar argument sales managers level against incentive plans is that the chemical salesman's job is very complex, involves a good deal more than selling. Salesmen must double as sales engineers who help customers with application problems. Salesmen must do missionary work on new products, provide technical service to customers. Moreover, one salesman may be asked to introduce a new product at a customer's headquarters plant, but receive no tangible credit because the product may be used in some other salesman's territory.

In other cases, managers argue, chemical salesmen must work in research and development departments, rotate between laboratories and customers.

Chemical sales executives who put forth any of these arguments against incentives fail to realize how inventive sales compensation has become. Equally formidable complexities have been overcome in other industries, in companies of all sizes.

Then there's this argument against incentives: the chemical salesman is a highly educated man, a "professional" type—and often a technical man—who gets great satisfaction out of his work. Therefore, chemical salesmen don't need money incentive, critics of incentive plans claim.

While this argument may have some truth, it is doubtful that any salesman —regardless of professional attitude— would turn down the chance to increase his earnings.

Firms with profit-sharing plans may oppose paying salesmen by incentive plans on the grounds that profits are shared generously with all employees. Salesmen's compensation includes this extra whenever the company can afford it.

Unfortunately, this argument fails to recognize that motivation is a highly individual matter. There is relatively little an individual salesman can do to affect over-all company profits. Result: he may get a bonus if manufacturing costs are low; when he does an outstanding sales job, however, his profit-sharing bonus may be nominal or nil if costs are high.

What's more, profit sharing tends to overpay some salesmen, underpay others. A sound incentive plan, on the other hand, rewards a salesman in proportion to the success of his individual efforts.

Fringe benefits offer another convenient "out" to those looking for one. It's not uncommon to hear a sales manager declare: "Our company has a good retirement plan and pays its

Here's one good way used by some chemical firms to salaries objectively (weight x ✓ = points)

Step 1: Determine relative importance of sales territories

Sample Factor	Weight	1	2	3	4	5	6	7
Derived sales volume	10						✓	
Derived gross profit	10				✓			
Accounts over $100,000	8	(0-5)	(6-9)	(10-19) ✓	(20-29)	(30-39)	(40-49)	(50-59)
Number of accounts	5	(under 20)	(20-29)	(30-39)	(40-49)	(50-59)	(60-69)	(70-79) ✓
Lack of management influence over territory*	5				✓			
Travel difficulty*	3		✓					

Territory A — Total

Territory B

Territory C

Step 2: Rank salesmen by how good a job they do

Sales effectiveness[1]	10					✓		
Effort*	7							✓
Ability to train others	5				✓			
Sales judgment*	3							
Years of experience	3	(less than 1 year)	(1-2 years)	(3 years)	(4 years)	(5 years) ✓	(6 years)	(7 years)

[1]include bonus record
*estimate

Joe in territory A — Total

Jack in territory B

Jim in territory C

Step 3: Rank territories; set salary ranges; fix salaries

Territory A	$9,000	9,500	10,000	10,500	11,000
Territory B	$7,000	7,500	8,000	8,500	9,000
Territory C	$5,000	5,500	6,000	6,500	7,000

Jack — Joe

figure salesmen's

8	9	10	Points
			60
			40
(60-69)	(70-75)	(over 75)	24
(80-89)	(90-100)	(over 100)	35
			20
			6
points			185
Total points			160
Total points			135

			50
			49
			20
✓			24
(8-10 years)	(10-12 years)	(over 12 years)	15
points			158
Total points			140
Total points			145

11,500	12,000
9,500	10,000
7,500	8,000

Jim

employees—including salesmen—substantial fringe benefits." There is no denying that fringe benefits are a worthwhile plus for salesmen, or any other employee, for that matter. But the relationship between fringe benefits and salesmen's motivation, is, at best, slight.

How Much Is Enough?

Many factors help determine what total income a chemical salesman should receive. Much depends upon the company, the particular job requirements and the products he sells. Despite these variables, two principles may be used to furnish sales executives with a measure of guidance for fixing a salesman's total income.

In general, total compensation paid to salesmen should correspond roughly to that received by salesmen doing similar jobs in competing firms. In other words, a salesman should not be tempted on this score to join a competitor's team.

Generally, too, a salesman's earnings should correspond fairly well with the earnings of those key individuals in customers' organizations with whom the salesman has regular dealings. That is to say, a $7,500/year salesman calling on a $20,000/year purchasing agent cannot be expected to develop anything more than a routine buyer-vendor relationship.

Yet, the bonds of friendship a salesman forms with customers outside of working hours is likely to be one of his strongest assets. For that reason, a salesman should be able to cultivate these relationships on the basis of equality. And a generous expense account doesn't help much here. Expense accounts can't give a $7,500/year salesman the standard of living of a $20,000/year purchasing agent.

In most chemical firms, even those now offering incentive payments to salesmen, salary always makes up the big share of the salesman's income. It's important that the salary structure does not contain inequities; it's also important that salaries are not so high that incentive payments would result in overinflated earnings.

If there's any doubt of the soundness of the salary structure, a complete overhaul is indicated before an incentive plan is applied. In fact, unless the sales salary structure was initially drawn up by someone close to the



Meet the Author

John W. Barry (A.B., '27, Harvard), vice-president of New York management consultants Wallace Clark & Co., has been specializing in marketing problems since '45. Firms with weak sales organizations are his prime targets in a cause that has gained him as good a reputation in Europe as he enjoys in the U.S.

Chemicals, pharmaceuticals, rubber, steel and building materials are Barry's specialties. To date, he has completed some 100 projects relating to incentive compensation, marketing costs, sales training programs, marketing organization, marketing research, sales forecasting and sales-effort analysis.

After two years of postgraduate study in marketing and advanced statistics at the University of Pennsylvania, Barry began his business career in banking. He shifted to sales, became sales manager of Mione Mfg. Co. (Collingdale, Pa.), a soap and chemical firm, still serves on its board of directors. He has also held the post of assistant sales promotion manager of Scott Paper Co. During World War II, he headed an OPA paper products division, later managed a shell-loading plant.

Barry's management consulting work and business background have kept him close to salesmen's compensation problems in chemical firms.

Here's one good way used by some chemical firms to achievement bonus standings (weight x ✓ = points)

Sample Factor	Weight	1	2	3	4	5	6	7
Met all product quotas	10			✓				
Increased present share of customers' business	10	✓						
Performed introductory work on new products	8							✓
Opened new accounts	6		✓					
Established us as alternate source of supply	5							
Self-improvement	4	✓						
		Joe						Total
			Jack					
				Jim				

CW Report

salesmen's jobs, it may be a good idea to do this whether or not an incentive plan is adopted.

In reviewing the salary structure, sales executives should keep in mind that sales for many men in the chemical field is merely a training ground. Sales salary structures should not be so high that they impede transfers of salesmen to other jobs in the company. Ex-salesmen should not be dissatisfied with their income as, say, technical service men.

Technical service men, as well as other company personnel, often work closely with salesmen. Salaries for both jobs should be considered in relation to one another. A wide disparity in incomes between men working with one another on the same customer problems means courting dissatisfaction of one of them.

There should, however, be a range of salaries available to any salesman, so that he can expect to make reasonable salary progress.

Question of Values

Ideally, a salesman's salary should reflect both the worth of his territory and the worth of the man himself. Sales managers can objectively fix both these values and, hence, the salesman's salary. As working tools to facilitate the analysis of a salesman's job, a method similar to that charted on pp. 82 and 83 may be developed.

Rating the Field: The territory is evaluated in terms of its importance to the company, and in terms of its difficulty to cover (*see Step 1, p. 82*).

"Factors" that make one sales territory more important and harder to handle than another territory vary from company to company. Each sales manager must choose his own factors.

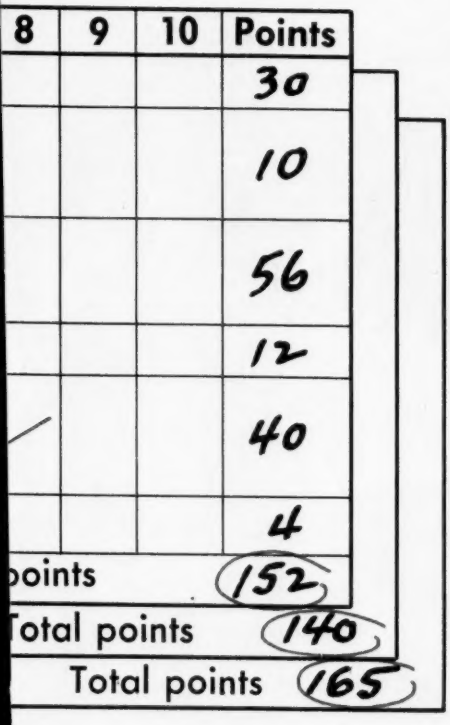
For example, a sales territory with a high percentage of important customers is ordinarily more difficult to handle than one with few important accounts. It means greater responsibility for the salesman.

In some cases, on the other hand, substantial sales volume may be controlled by company officers and directors through their personal, trade or financial connections. Salesmen handling the customers involved may require administrative talent more than creative selling ability.

All in all, the controlling factors in evaluating territories are usually present and potential sales volume. Some sample factors that may be used on territory rating charts are: derived sales volume; derived gross profit; number of accounts over $100,000; number of accounts; lack of management influence over territory; travel difficulty.

Arbitrary "weights" that show relative importance of these factors might run something like this: 10, 10, 8, 5, 5 and 3, respectively. Any values may be assigned, providing the weights reflect the importance of the factors.

figure salesmen's



By multiplying these weights by an appropriate scale value for each territory, the sales manager can arrive at a point rating that expresses the relative importance of each territory.

Rating the Man: The procedure for rating the salesman is necessarily somewhat more subjective than that employed for rating territories. But a systematic procedure (*see Step 2, p. 82*) sometimes supplemented with psychological tests, can minimize subjectivity.

Caution: evaluating salesmen by this method should never be left to one individual. Where this method is effectively used, it is usual for an assistant sales manager to fill in the ratings for review by sales managers.

Here, as in evaluating territories, sales managers should keep in mind that salesmen are being rated relative to one another.

Payoff: The salesman's salary is finally arrived at by listing territories in descending order of point ratings; a salary range is assigned to each territory; and the salesman's point rating determines the dollar figure within the range.

For example (*see Step 3, p. 82*), Jim in Territory C fares better than Jack in Territory B even though Jim's territory is rated as being less important. In this case, Jim's own higher relative standing offsets the financial handicap imposed by his territory.

Salaries so developed are seldom rigidly followed. There are always individual salesmen out of line. If properly developed, the procedure tends to follow the mental processes that a conscientious sales manager might utilize.

Being more systematic, however, the method minimizes errors of judgment. It helps establish logical and fair salary ranges within which salesmen may progress, sets their salaries at defensible figures within that range.

No Pat Answer

Few specialists in sales compensation can cite a tried and tested procedure that any sales manager can use for devising an incentive plan to meet his company's particular needs.

In fact, even an expert's approach, as one specialist expresses it, is largely "study, then cutting and fitting until the plan works."

One of the key decisions a sales manager must make in setting up an incentive plan is how total compensation will be divided between the fixed portion (salary) and the contingent portion (incentive).

This ratio hinges on the nature of the salesman's job and what is expected of him. In many ways, it is a problem in practical psychology. Word of caution: don't think that by merely superimposing even a well-designed incentive feature on any existing salary structure all problems of salesmen's motivation will be solved.

Two principles provide a guide for determining the breakdown between fixed salary and incentive income:

- When a salesman must perform more nonselling than selling duties, he should receive more of his income in the form of salary.
- To be effective, the incentive portion of a salesman's earnings should increase his base salary by at least 15%. A lower percentage seldom provides enough motivation.

Plans that Work

It may be said, almost categorically, that for most chemical salesmen, the bonus is the best incentive scheme. Reasons: it's more flexible than any other type of incentive plan, permits the sales manager to accurately target his incentives toward company sales goals. Furthermore, bonus incentive plans can be kept simple.

Various methods exist for establishing bonuses. One widely used system allows management to earmark a designated percentage of sales as a bonus fund. Individual salesmen are rewarded from this fund on the basis of points received for meeting management's goals.

For example, a fixed number of points are awarded a salesman for achieving designated product quotas; a different number of points are awarded for successfully completing introductory work on new products; another point value is set for opening new accounts, etc. A salesman earns points in direct proportion to how effectively he accomplishes these goals.

This method has the important advantage of keeping management's liability for bonus payments in predictable relationship to sales.

Another bonus-plan approach is to designate fixed sums of money for payment to salesmen who attain specific performance objectives.

The bonus plan in effect at Wyandotte Chemical Co.'s Michigan Alkali Division is typical of this plan. Salesmen selling basic industrial chemicals work on straight salary plus an annual bonus tied to individual improvement, performance and sales.

Two-Part Bonus Plan: With the growing tendency to develop salary structures on a scientific basis, it is becoming more and more usual to find companies offering their salesmen bonuses based on a percentage of their base salaries—up to, say, 25% as a maximum.

One such plan, in two parts, is now being successfully used, with minor modifications, by one of the largest U.S. chemical concerns. Many variations of it are also in effect.

The first part of the plan works like this. A three-year running average of dollar sales is calculated for a salesman's territory. This average is referred to as par.

A salesman can earn up to 12½%

Rule of thumb for determining a chemicals salesman's total income. It should correspond roughly with total income of . . .



. . . salesmen doing similar jobs in competing firms.



. . . key individuals in customer firms with whom he has regular dealings.

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of his base salary as a "sales" bonus based upon a comparison of his latest dollar sales with par. Under this plan, the salesman qualifies for a very small sales bonus as soon as his sales reach 90% of par; at 100% of par his sales bonus is modest; thereafter it increases rapidly until it reaches 130% of par. This yields him a maximum sales bonus of 12½% of his salary.

Salesman Jones, for example, whose base salary may be $10,000/year, could earn up to $11,250 by bringing his sales up to 130% of par.

Eligibility for bonus payment begins at 90%, rather than at 100% of par, under this plan. That's so salesmen aren't deprived of all incentive payment if business conditions are adverse and sales extremely difficult to make. Eliminating the bonus probably would destroy all motivation.

On the other hand, sales bonus levels off at 130% of par because in this particular firm, management feels that sales exceeding 130% of the three-year running average would mainly represent "windfall" business.

The second part of this particular incentive plan is dubbed an "achievement" bonus. Just as the sales bonus rewards salesmen for attainments reflected in the current years sales, the goal of the achievement bonus is to reward accomplishments that, in management's eyes, tend to build future sales.

Under this plan, a salesman could earn an additional 12½% of his salary by making top achievement bonus.

How can a salesman's achievement be measured?—by a method similar to that used for rating territories and salesmen's relative standing (*see chart, pp. 84 and 85*).

Factors used to determine achievement include:

(1) Opening of new accounts.

(2) Successful completion of missionary work on new products.

(3) Securing a spot on a customer's approved list as an alternate source of supply.

(4) Securing an increased share of a customer's business.

(5) Effort—the one element most difficult to evaluate objectively.

Our hypothetical salesman, Jones, by attaining maximum sales bonus of $1,250/year, brought his base salary of $10,000/year up to $11,250. By achieving maximum incentive bonus, he can top this by another $1,250.

The extra $2,500 that Jones earns as incentive payment is enough of a plus to get all the extra sales effort out of him that management can hope for. Actually, under this two-part plan, few salesmen ever attain maximum bonuses consecutively.

This particular plan has proved satisfactory in the company where it has been used for many years. It even contains a provision for raising base salaries of consistent winners of high bonuses. To date, the sales executives of the chemical firm employing this plan agree that it has contributed in important measure to the success and morale of their organization. And the firm's annual sales and profits increases have been outstanding in the industry.

No Need for Dry Runs: There are several ways for sales management to test an incentive plan before it is announced and installed. Any proposed plan must, of course, be tested under all statistical assumptions that can reasonably be made. Projected salesmen's earnings and the firm's or sales division's bonus liability can be figured in advance of installation.

Many sales managers prefer to conduct a dry run of six months, or even a year. This approach is questionable. A dry run cannot have any effect on salesmen's motivation. Such a test is not at all representative of the true



This man helps move 175 carloads of caustic at a time

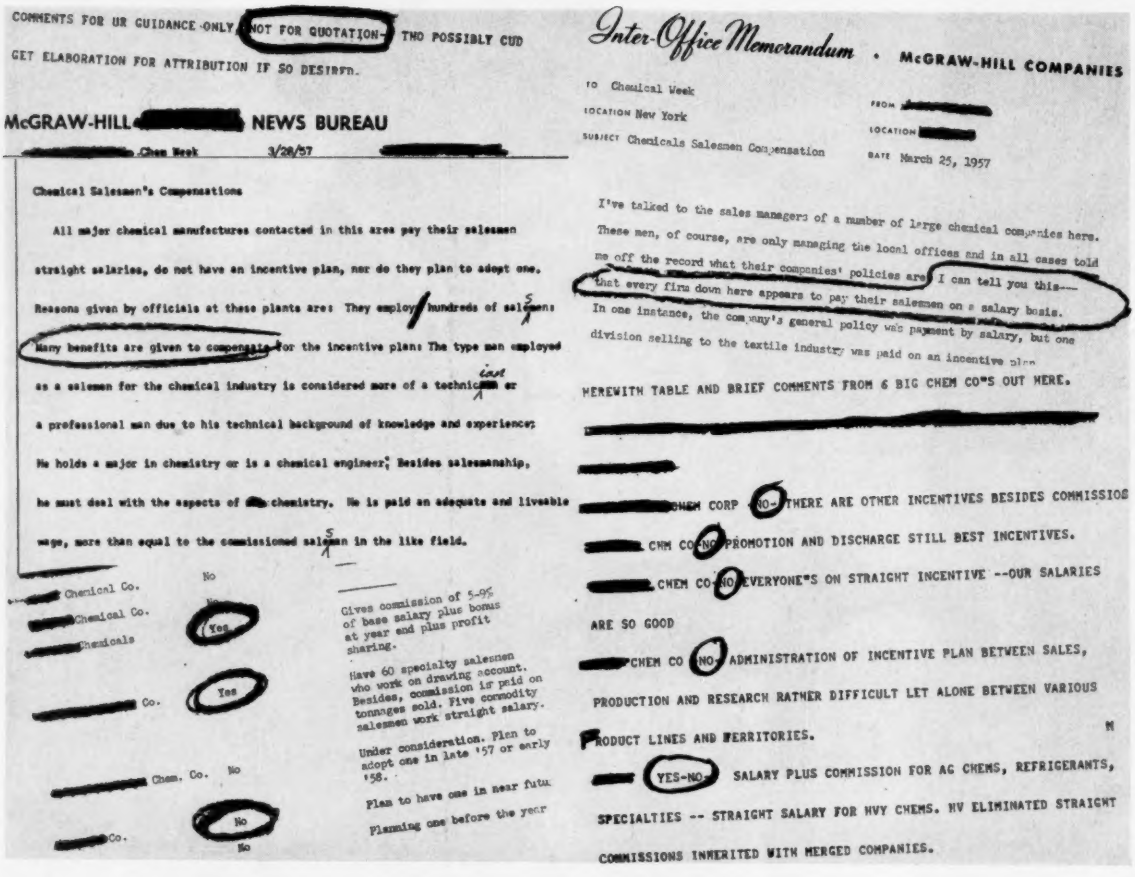
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McGRAW-HILL [redacted] NEWS BUREAU

[redacted] Chem Week 3/28/57 [redacted]

Chemical Salesmen's Compensations

All major chemical manufactures contacted in this area pay their salesmen straight salaries, do not have an incentive plan, nor do they plan to adopt one. Reasons given by officials at these plants are: They employ hundreds of salesmen. Many benefits are given to compensate for the incentive plan: The type man employed as a salesman for the chemical industry is considered more of a technician or a professional man due to his technical background of knowledge and experience; He holds a major in chemistry or is a chemical engineer; Besides salesmanship, he must deal with the aspects of chemistry. He is paid an adequate and liveable wage, more than equal to the commissioned salesman in the like field.

[redacted] Chemical Co. No
[redacted] Chemical Co. Yes
[redacted] Chemicals
[redacted] Co. Yes
[redacted] Chem. Co. No
[redacted] Co. No
No

Gives commission of 5-9% of base salary plus bonus at year end plus profit sharing.

Have 60 specialty salesmen who work on drawing account. Besides, commission is paid on tonnages sold. Five commodity salesmen work straight salary.

Under consideration. Plan to adopt one in late '57 or early '58.

Plan to have one in near futu

Planning one before the year

Inter-Office Memorandum • McGRAW-HILL COMPANIES

TO Chemical Week
LOCATION New York
SUBJECT Chemicals Salesmen Compensation

FROM [redacted]
LOCATION [redacted]
DATE March 25, 1957

I've talked to the sales managers of a number of large chemical companies here. These men, of course, are only managing the local offices and in all cases told me off the record what their companies' policies are. I can tell you this--- that every firm down here appears to pay their salesmen on a salary basis. In one instance, the company's general policy was payment by salary, but one division selling to the textile industry was paid on an incentive plan.

HEREWITH TABLE AND BRIEF COMMENTS FROM 6 BIG CHEM CO"S OUT HERE.

[redacted]

[redacted] CHEM CORP -NO- THERE ARE OTHER INCENTIVES BESIDES COMMISSIOS

[redacted] CHM CO-NO- PROMOTION AND DISCHARGE STILL BEST INCENTIVES.

[redacted] CHEM CO-NO- EVERYONE"S ON STRAIGHT INCENTIVE --OUR SALARIES ARE SO GOOD

[redacted] CHEM CO -NO- ADMINISTRATION OF INCENTIVE PLAN BETWEEN SALES, PRODUCTION AND RESEARCH RATHER DIFFICULT LET ALONE BETWEEN VARIOUS PRODUCT LINES AND TERRITORIES.

[redacted] YES-NO- SALARY PLUS COMMISSION FOR AG CHEMS, REFRIGERANTS, SPECIALTIES -- STRAIGHT SALARY FOR HVY CHEMS. HV ELIMINATED STRAIGHT COMMISSIONS INHERITED WITH MERGED COMPANIES.

Just How Many Chemical Firms Have Sales Incentives?

To determine how widespread is the need for sales incentive plans in the chemical industries, Chemical Week conducted a capsule survey. Regional editors in Chicago, San Francisco, Houston, Cleveland, Detroit, Los Angeles and Dallas queried some chemical firms in their area.

Of 36 companies responding, 22 "no's" were recorded to 14 "yes's." Some of the survey results are pictured above. It's interesting that unsolicited comments (upper left-hand side) from respondents almost parrot Author Barry's statement of arguments that sales managers use against incentive plans (*see chart, pp. 81 and 82*). For example: "Many benefits are given to compensate for (lack of) incentive plan," and ". . . a salesman for the chemical industry is considered more of a professional man."

Because most company executives requested that their firms remain anonymous, the above composite qualitative sampling of survey results has company names and locations of *CW* regional offices blacked out.

results that could reasonably be expected of the incentive plan.

On the other hand, sales managers should announce a new incentive compensation plan in a more or less formal manner. Soon after announcing the plan and distributing copies of it to salesmen, individual and group question-and-answer sessions should be held. Where geographic limitations rule out such a get-together, sales supervisors should explain the plan in their respective areas.

Seldom is it necessary for sales managers to explain the salary determination procedure in detail—especially in cases where this is made part of a new plan. It is, however, very important that elements of any new salary determination procedure be fully explained to salesmen, both collectively and individually.

Annual or semiannual salary reviews offer sales managers or super-



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(2) Aromatic hydrocarbons
(3) Alcohols
(4) Glycols
(5) Glycol Ethers
(6) Esters and ketones

OILS:

(1) Petroleum (mineral) oils
(2) Animal oils
(3) Vegetable oils

MISCELLANEOUS LIQUIDS:

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(2) Plasticizers
(3) Liquid resins

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(a) Thixotropy, non-stringiness
(b) Viscosity increase (bodying action)
(c) Suspension of pigments, fillers, etc.
(d) Controlled flow, anti-sag, non-drip
(e) Controlled (reduced) penetration into porous surfaces
(f) Color uniformity, non-flooding, non-silking, etc., in pigmented systems
(g) Product stability: improved compatibility of ingredients, preventing their separation or bleeding on standing
(h) Improved applicability (better brushability in paint systems, etc.)
(i) Lower cost of many products through use of higher solvent, lower solids concentrations
(j) Greater freedom in formulating

...if you make these products:

Adhesives (non-aqueous)
Calks, Putties and Glazes
Carbon Paper
Ceramic Solutions
Coated Fabrics and Paper
Cosmetics
Dry Cleaning (Spotting) Compounds
Inks:
(a) Textile Printing
(b) Silk Screen Printing
(c) Mineral Oil (News)
(d) Oleoresinous
(e) Glycol (Steam Set)
(f) Flexographic
(g) Ball Point
Lubricants
Pharmaceuticals
Polishing Compounds
Protective Coatings:
(a) All trade sales
(b) Industrial primers and coatings
(c) Pigment stains
(d) Colors-in-oil
(e) Wood fillers
(f) Shellac
(g) Traffic paint
Reinforced Plastics:
(a) Polyester
(b) Epoxy
Rubber Cements and Solutions
Vinyl Plastisols and Organosols
Water-in-Oil Emulsions
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visors excellent opportunity to review a salesman's performance, explain any salary action taken or not taken.

Outside Help?

In an area as tricky as incentives, there's much to be gained by calling in consultants who specialize in this field. Aside from "cutting and fitting," they survey competitor's compensation levels and practices, make meticulous study of salesmen's jobs and territories.

The consultants can be objective in many areas where sales executives might not. What's more, a consultant can undertake surveys that sales executives cannot.

Here, for example, is how a consultant went about finding out whether a client's sales compensation program needed revamping. After a series of detailed interviews with the company's salesmen, the consultant personally called on a number of key purchasing agents who buy the firm's products. Keeping the client's name anonymous, he asked the P.A.s these questions:

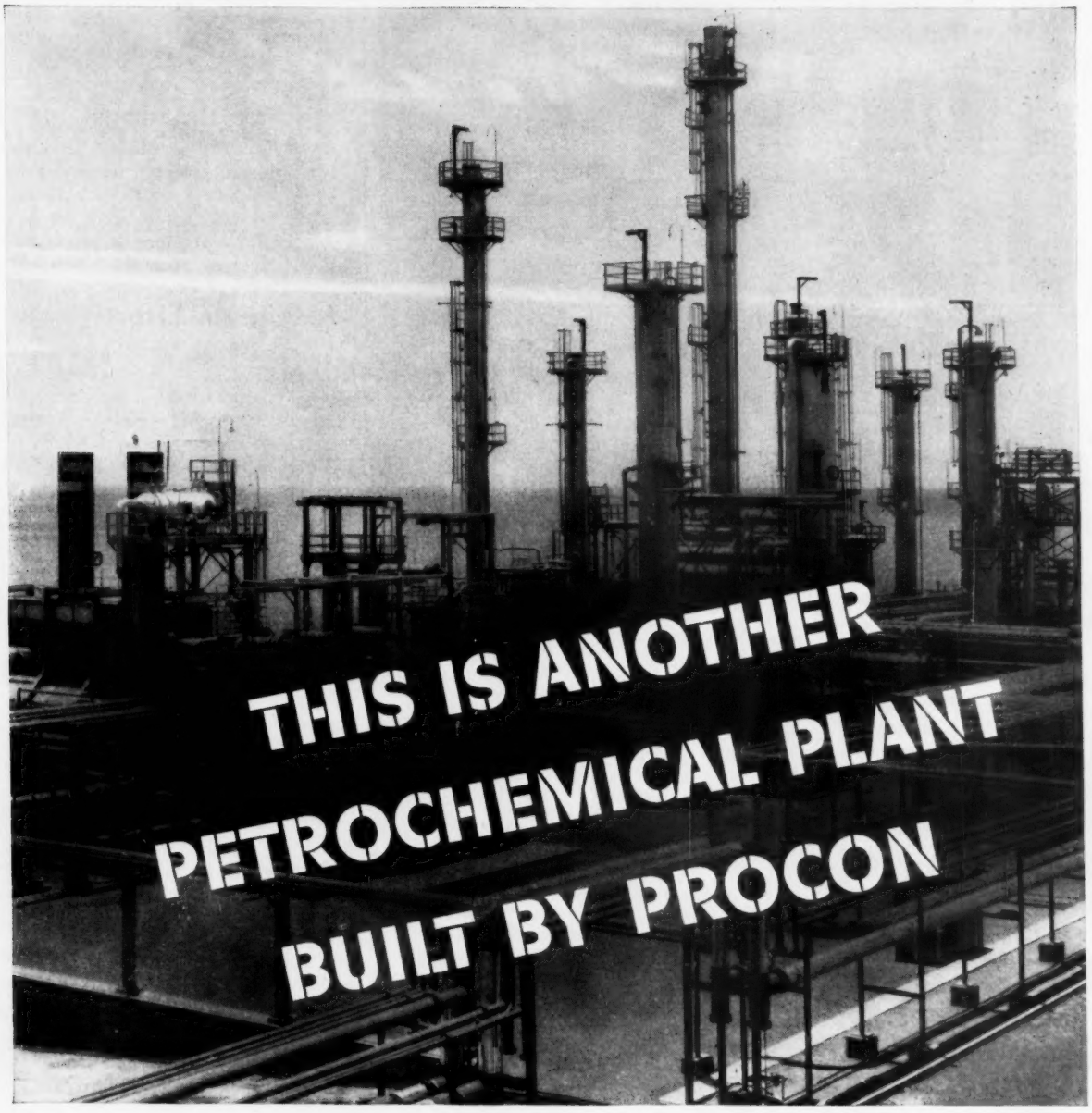
- What do you expect, and should you expect, of a salesman who calls on you to sell this kind of chemical product?
- Which company's salesmen, in your experience, meet the requirements set forth in reply to the previous question?
- Which company's salesmen meet the requirements most effectively?
- Which company's men meet them least effectively?

While many purchasing agents answered evasively, enough positive responses were gathered to detect a distinct pattern. This fact evolved: the client firm's salesmen were falling short of the mark. A revamped sales compensation plan was needed.

Many sales executives develop their own plans succesfully, without outside aid. A word of caution should be cited for sales managers who prefer the do-it-yourself approach: sales compensation is a field fraught with many potential pitfalls.

Probably the most commonly encountered snag comes in making incentive plans too complex. Another is in deferring incentive payments too long after they have been earned.

Most experienced sales managers



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used at Oil Refineries, are rugged, easy to operate and moderately priced.

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This type of installation would be considered rugged service for other equipment but V-notch Chlorinators are designed for such use. They are made of materials that are completely resistant to corrosion as well as weather. They are simple to operate and to maintain. In addition, W&T V-notch Chlorinators are an attractive piece of equipment, colored green to fit into industrial color schemes.

For more information about W&T V-notch Chlorinators, send for bulletin CD-44.

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CW Report

and consultants working in the incentive field can probably recall at least one case where sales organization efficiency and morale were all but destroyed by installing a poorly designed incentive plan.

Maximum Effort

A surprisingly large number of chemical company salesmen are still being paid by straight salary, whereas the majority of all industry salesmen are paid by incentive.

Even among those chemical salesmen who are paid by incentive, few are paid by plans that are properly designed to meet their own management's particular sales goals. The science and art of incentive compensation for salesmen is more flexible and adaptable to chemical sales jobs than ever before. Those sales executives who continue to ignore the advantages that an incentive plan can bring are losing out on an opportunity to get the maximum effort from each salesman.

Companies whose salesmen are not giving their all to the selling effort, or who aren't directing their efforts to management's goals, are handicapped in the race for bigger sales and profits.

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Cargoes of soda ash, cement, and mineral calcium fluoride filled this covered hopper car for eight years. An occasional washing was the only maintenance needed; the car was protected by a **Sherwin-Williams** "Carclad" coating system based on BAKELITE Brand Vinyl Resins.

The car above hauled caustic chemicals for eight years. Sledge-hammer blows to loosen these cargoes dented the metal sides. Storms, sun, corrosive atmospheres were regularly encountered. But the coating based on BAKELITE Brand Vinyl Resins held fast.

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Rarely can you find a more corrosive environment than that of a tannery. For instance, pipes in one large Minnesota tannery (carrying salt, sulfuric acid, alkali, hard water and chrome liquor) became corroded and had to be replaced frequently, some as often as every week. Also, there was the constant hazard of dangerous chemical leaks. A piping break always damaged the floor, often stopped plant operations.

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"In all that time," says the tannery manager, "the Uscolite Pipe has shown no sign of wear, even though in use 24 hours a day, 6 days a week. We're ordering more and more of it for use throughout the plant."

Uscolite plastic pipe is extremely light in weight, yet has very high impact strength. It is resistant to corrosive chemicals and is non-contaminating. The Uscolite line includes everything for a complete pipe assembly, including the Hills-McCanna Valve. Contact any of the 28 "U. S." District Sales Offices, any of the selected "U. S." Distributors, or write us at Rockefeller Center, New York 20, New York.



After 2 years on the job, note the smooth, unharmed exterior of Uscolite Pipe (at left) while metal pipes are heavily corroded.

Mechanical Goods Division

United States Rubber

Technology
Newsletter

CHEMICAL WEEK
April 20, 1957

A new calcium process being piloted by Air Reduction could prove to be a real "sleeper." At present the firm will admit only that it is working with such a process, that it starts with calcium carbide.

Most likely, it involves the dissociation of calcium carbide under heat and vacuum, an idea that isn't revolutionary in itself. H. H. Franck and K. H. Hou back in 1937 published a paper (Anorganische Chemie, Vol. 232) that implied that metallic calcium would form from calcium carbide at temperatures between 800 and 1400 C under high vacuum.

Airco, when it started exploring the process, found that in some respects its development work was paralleling work being done by Pechiney in France. So the two made an agreement to exchange know-how on the project.

There are some problems in adapting the principle to commercial equipment. Although Airco is not saying anything at all about the status of the project, it is believed to have cleared some of the major hurdles.

Other companies, of course, have worked out calcium processes. During World War II, the U. S. got its calcium from the electrolysis of fused calcium chloride. Later, a process for making it from lime by a thermal reduction with aluminum under vacuum was developed.

Ethyl developed a process for making a finely divided, free-flowing calcium from the by-product of sodium manufacture. But it found that at the price it had to charge ($1.50/lb.) the market was small.

Airco is shooting at a figure considerably lower than that. It frankly doesn't expect to be able to compete with sodium (at 18-20¢/lb.), but it reportedly feels that it can sell calcium in the 40-50¢/lb. range in volume production.

Since Airco has high-quality calcium carbide available (from its National Carbide operations) it turns out a highly purified calcium metal. Exactly what the market would be for such a product is debatable. It has been estimated, though, that calcium at 30-50¢/lb. could command a market of 10-20 million lbs./year (*CW, April 17, '54, p. 87*). Airco is believed to be exploring the market potential right now, and is believed to have found some encouraging signs. At least one promising possibility has turned up. It involves deoxidation in a metallurgical operation.

•

New knowledge of the size of the high-energy fuel program of the government can be gleaned from an announcement by Metal Hydrides. It has signed a contract to deliver $9.2 million worth of sodium borohydride over an 18-month period.

Just how many pounds this represents has not been made public. But you can get an idea of the order of its magnitude. Metal Hydrides has previously stated that sodium borohydride could eventually be made under commercial conditions at a cost that would permit a selling price of $10/lb. That would mean that the 18-month contract could cover a maximum of 1 million lbs. of borohydride. A minimum figure would be about 300,000 lbs.

It has never been made clear, either, exactly how the sodium borohydride is used to make high-energy fuels. Presumably, it will be one of the starting materials for alkyl boranes (*CW Business Newsletter, March 16*).

•

There may well be two hecogenin producers soon. Syntex S. A. is studying engineering plans for an extraction plant that would put it into competition with Productos Esteroides *(see p. 41)*. The plant would be built in Mexico's Yucatan Peninsula.

Syntex, too, is considering construction of another plant at its headquarters—about nine miles west of Mexico City—to convert hecogenin into cortisone and related products. Syntex says it has been studying hecogenin since 1949. It emphasizes that the new plant would supplement —not replace—its present production of cortisone from barbasco root.

•

Three chemical discoveries that could be technological milestones in the treatment of diseases:

• University of California scientists discovered a new and distinct species of ribonucleic acid (RNA), an essential component of live tissue. Up to now, it has been thought that RNA was composed of four nitrogenous components (adenine, guanine, cytosine, uracil). The California researchers found a species with 5 nitrogenous components, think there may be even more. This new knowledge may clear up some of the discrepancies in the theories concerning the role of RNA in studies of protein synthesis, virology and cancer.

• University of Wisconsin workers have discovered a new quinone that acts as a link in the electron transfer chain within the body. It could be an important step in delineating the mechanism of electron transfer in the body's basic oxidation processes, as when electrons shift from substances oxidized—during the burning of food for energy—to molecules of oxygen.

• Two researchers from Stanford Medical School have found metallic components (iron, copper, calcium, magnesium) in a virus, theorize that they may be the cohesive force that binds the smaller nucleic acid subunits into the larger particles characteristic of infectious nucleic acid.

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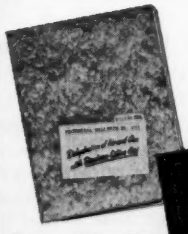
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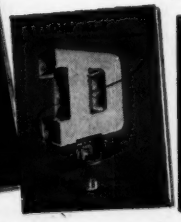
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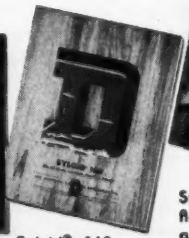
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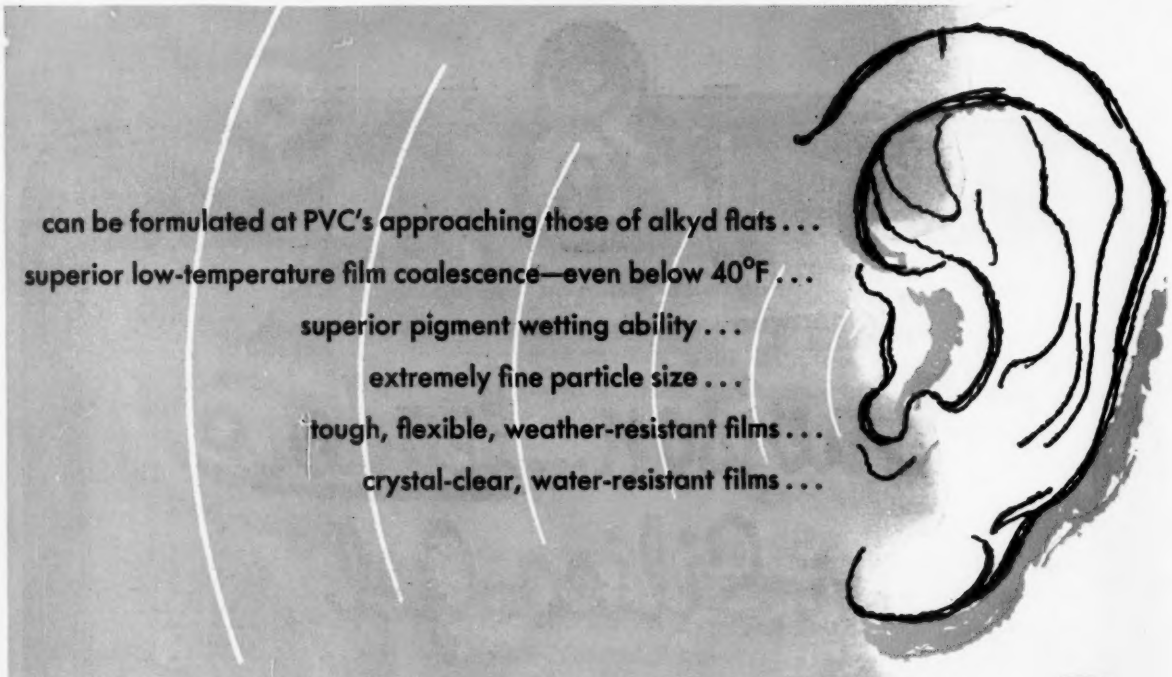
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DISCARDED PADDLEWHEEL, MODERN BARGE point up Louisville's past and present ties to river transportation.

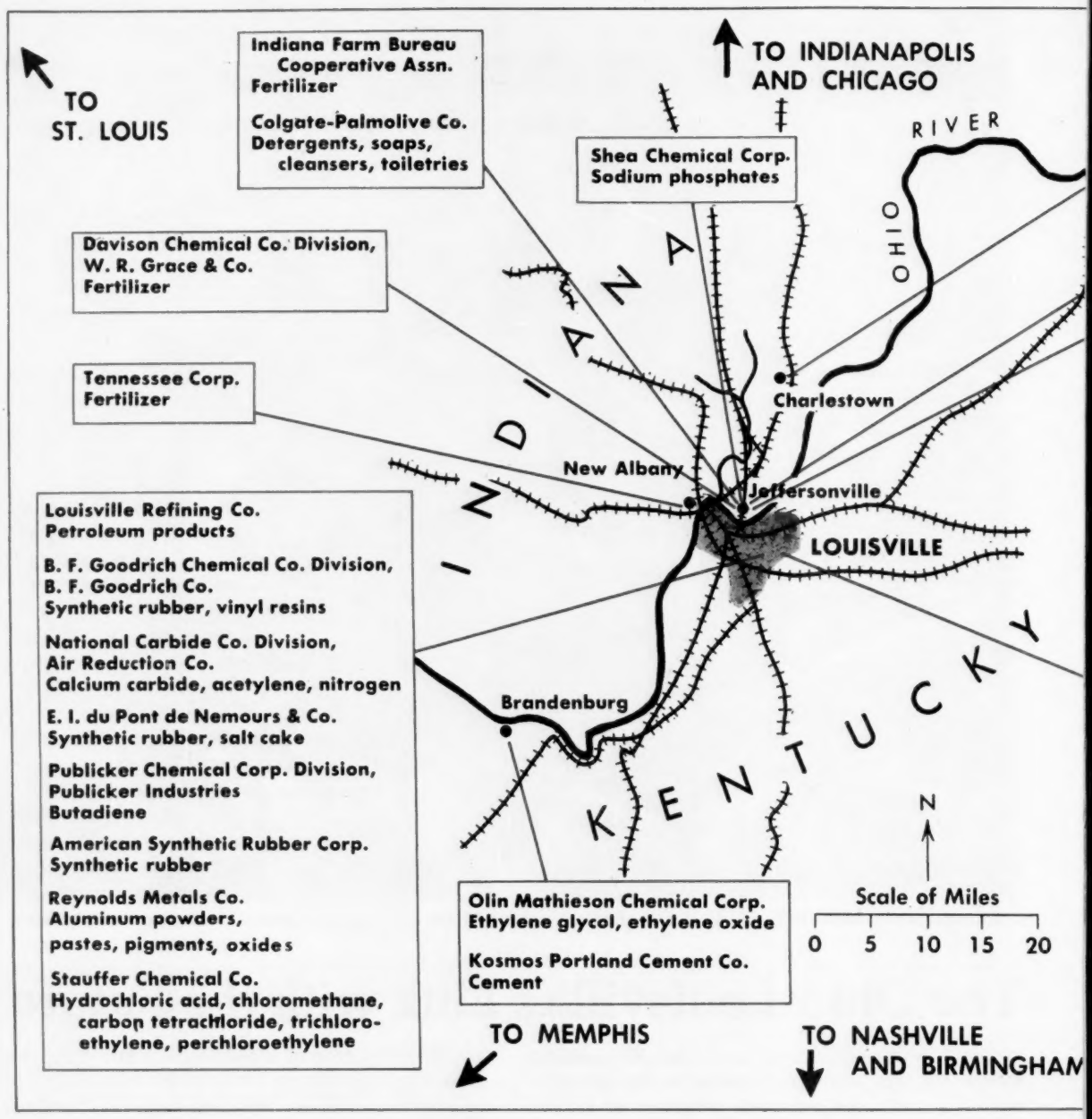
The Ohio: Louisville's Link with the Future

The 178-year-old city of Louisville, Ky.—which feels it has been relatively neglected in the chemical and other industrial expansion programs of recent years—is contemplating new moves to increase its attractiveness.

This metropolis on the mighty Ohio River has not been entirely bypassed by chemical process companies in the latest rounds of plant-building. Among current projects at Louisville:

- American Synthetic Rubber Corp. has spent $3.5 million to increase by 50% its capacity for GR-S synthetic rubber; units that formerly turned out only two types of rubber will soon be turning out 11.
- B. F. Goodrich Chemical, with a $2.5-million expansion, has just doubled its capacity for specialized synthetic rubbers.
- Stauffer Chemical is completing a two-year, several-million-dollar expansion that includes a new loading-unloading dock for incoming barges of chlorine, outgoing barges of chlorinated hydrocarbons. Output of carbon tetrachloride, perchloroethylene and hydrochloric acid is being substantially increased, and facilities are being added for two new products, chloroform and methylene chloride. The new units are to be on-stream by this summer.
- Later this year, Girdler Co., division of National Cylinder Gas Co., will complete construction of a $450,000 plant to increase its output of catalysts.

'Country Politics': But, by and large, Kentucky hasn't generally been keeping up with most Southern states in industrial growth. And, within Kentucky, most of the large new chemical projects have gone, not to

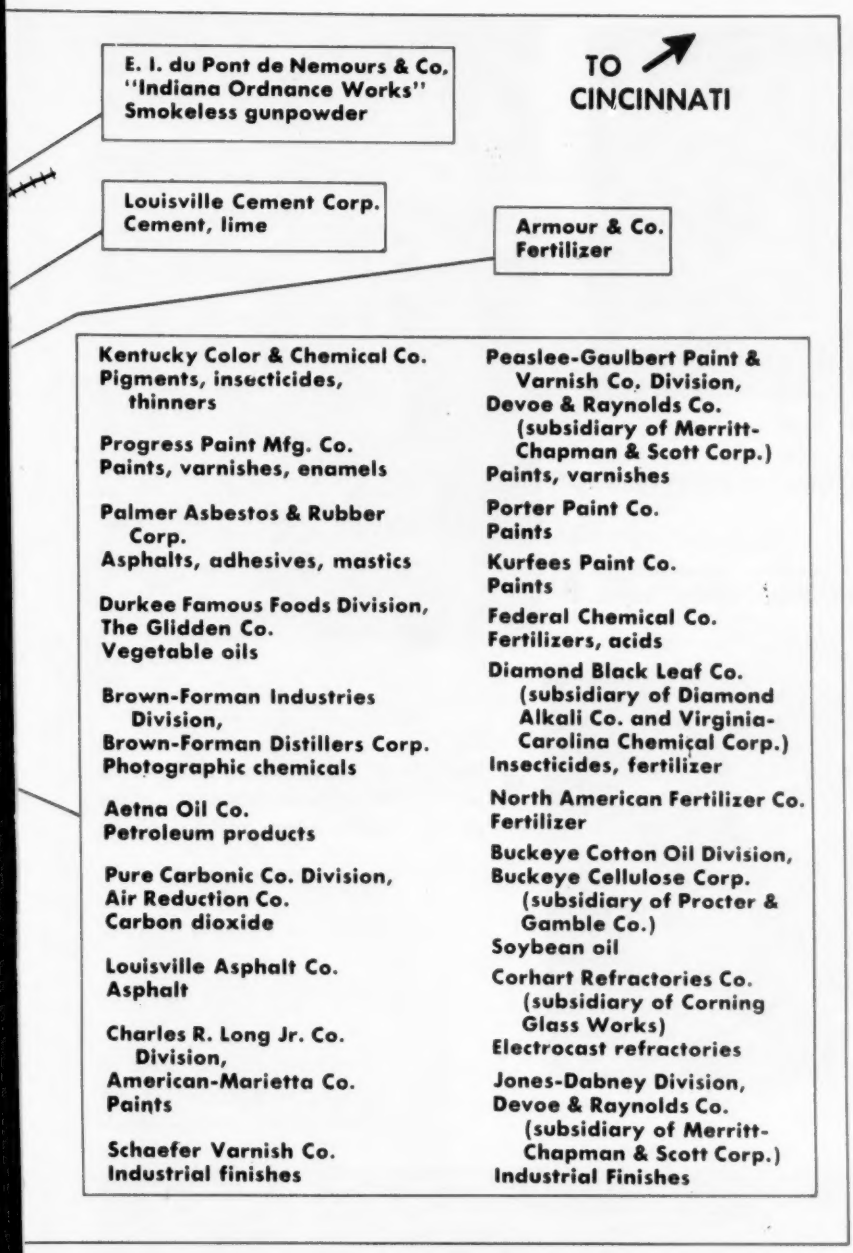


Louisville—which up to now has had about 65% of the state's manufacturing horsepower and manpower—but to industrial newcomers like Calvert City, 160 miles to the west.

Business men are prone to lay the blame for this situation on what they call "country politics." This charge boils down to a comparison of state laws pertaining to business and industry, with Kentucky standing out as one Southern state that has failed to enact certain types of laws that are deemed to be conducive toward a "favorable climate" for industry.

For example, Kentucky doesn't have a "right-to-work" law; and the legislature's persistent refusal to pass a sales tax law is said to leave a disproportionate share of the total tax burden on industry. Defenders of Gov. Albert (Happy) Chandler's administration in Frankfort retort that chemical and other industries are booming in the only other Southern state without a right-to-work law (Louisiana); and that a survey is now under way to determine how Kentucky's state corporate income tax rate—7% on earnings left after payment of U.S. taxes—compares with tax levies in other states.

Factories vs. Horses: The question of whether Louisville should be getting more industry is a local issue that reaches peak intensity at just about



this time each year—during the weeks preceding the annual running of the Kentucky Derby at Louisville's Churchill Downs. This is because the principal opposition to the proindustry faction comes from citizens who are more interested in thoroughbreds and the tourist trade.

One major exception is Clifford Lussky, whose titles reflect his belief that industry and horses are compatible after all. He's president of Progress Paint Mfg. Co. and also president of the Kentucky Thoroughbred Breeders' Assn., and his "Federal Hill" is expected to be one of the favored contenders in this year's Derby (May 4).

Louisville's Chamber of Commerce concedes that new industry has become something of a rarity and is looking for ways in which the business climate can be improved. One possibility: the Louisville Industrial Foundation, which supplements local banking services by offering loans to new industries. Present limit on such loans is $100,000, but there's a move to raise this to $200,000.

Paints, Rubbers, Plastics: Louisville has long been a paintmaking center, and during the months before Pearl Harbor it appeared that this city might be the country's synthetic rubber capital. In 1941, Goodrich and National Carbide GR-S plants were already in operation, and Du Pont's Neoprene plant was under construction. But in paintmaking, Louisville slipped from sixth place in the 1940s to about eighth or ninth place now; and the petroleum-rich Gulf Coast has far outstripped Louisville's "Rubbertown" district in production of synthetic rubber and intermediates.

And even while the rush to Calvert City and to other Southern states was hitting its stride, there was never a complete standstill on the industrial front at Louisville. Shea Chemical built its sodium phosphates plant in 1954, Olin Mathieson's ethylene glycol-ethylene oxide plant at nearby Brandenburg went onstream in '55, and Devoe & Raynolds recently set up new research laboratory and executive offices in Louisville. The photographic chemicals division of Brown & Forman Distillers Corp. is another postwar addition to Louisville's chemical lineup. Too, smaller chemical producers have been cropping up more or less regularly.

Year-round Waterway: Louisville's prime asset for manufacturers is still the big, broad Ohio River, which has been one of the nation's main arteries of trade ever since locks were built at Louisville in 1830 so that shipping could pass around the rapids near the city. As a principal transportation hub of the upper South, Louisville has eight trunk-line railroads, five passenger airlines and one scheduled freight airline, and eight major highways.

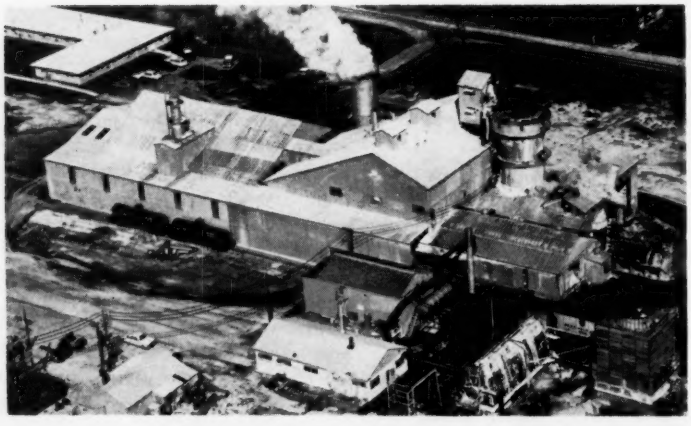
Process water—from the river and from underground sources—is plentiful. The underground water has low mineral content and virtually constant temperature, but there's disagreement as to whether the supply is being replenished as rapidly as it's being used. Utility companies have expanded recently, can supply large industrial users with natural gas at rates as low as 3¢/100 cu. ft., and electric power (special busbar service) for as little



Organic chemicals from natural gas: Olin Mathieson's $25-30 million Doe Run plant on the Ohio at Brandenburg.



Old-line paint firm: Inside Louisville, Jones-Dabney division makes industrial finishes, epoxy resins.



Phosphates for detergent makers: At Jeffersonville, Shea Chemical's phosphoric acid-sodium tripoly plant.

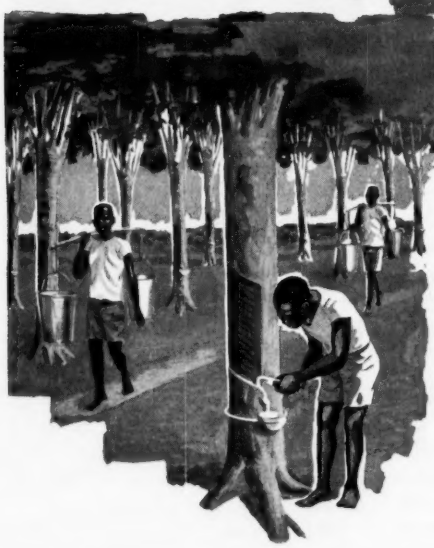
Synthetic rubber center: West of town, Rubbertown's chemical companies have $20-million payroll.

as 5 mills/kwh. Kentucky coal costs about $5.80/ton delivered, and good plant sites can be bought for about $6,000/acre in or near the city of Louisville and for about $100/acre outside of Jefferson County.

One factor that'll affect Louisville's future as a chemical industry center will be disposition of the federally owned butadiene plant. Even more important will be the basic economics of supplying the Midwestern and Southern markets for chemical products. Whether the need for political and legislative changes looms large or small relative to those other factors is sure to be debated in next year's meeting of the state legislature.

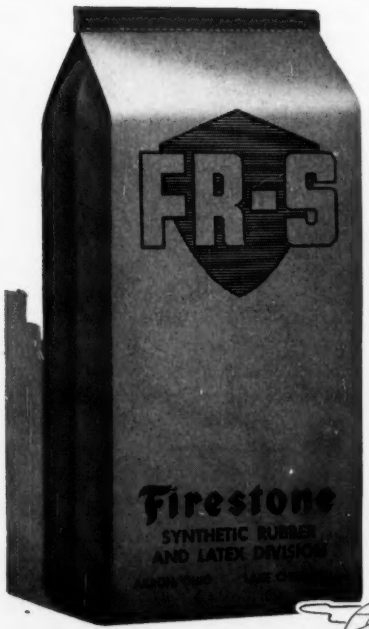


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Office Help a la Carte

In the constantly growing chemical process industries, there's often a sudden need for clerical staff reinforcements. One current example: Olin Mathieson Chemical Corp.'s recently organized Primary Aluminum Division.

Because of the need to get administrative work done before permanent office staffs could be set up, the division called upon Office Temporaries, Inc. (New York)—one of several firms providing temporary office help for industrial clients—to supply as many as 15 temporary workers at a time, for periods ranging from three days to three months. OM officials felt it would be inadvisable to set up permanent office staffs in New York for management that would be moving to other locations as soon as plant facilities could be completed.

Qualified Help Available: McKesson & Robbins has relied for some time on Office Temporaries' employees to help out during overload periods, and the accounting department at Allied Chemical's General Chemical Division has used temporary comptometer operators, clerks and bookkeepers to meet the rush of end-of-the-month closings.

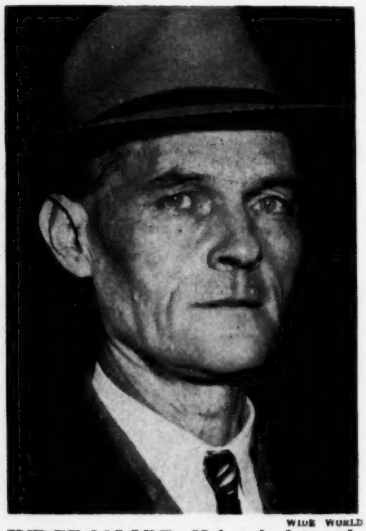
Agencies of this type also provide help for special research jobs, vacation peaks and personnel changes.

Other chemical process firms using Office Temporaries' employees include Union Carbide and Carbon Corp. and Olin Mathieson's E. R. Squibb Division.

Office Temporaries, a spokesman said, employs thousands of qualified workers who wish jobs for specific periods of time or for regular parts of the work week. Most of the employees are retired career girls whose families do not require all their time, students who want to earn extra money, or those who are seeking supplementary income.

After they are tested for ability and interviewed for their interests, acceptable applicants are placed on the Office Temporaries payroll. They are then sent out on jobs according to their preferred schedules and client orders.

The client does not place the temporary help on his payroll, but instead pays a fee to Office Temporaries that covers both salary and services.



WIDE WORLD

JUDGE MOORE: He's asked to rule on alleged insecticide infringement.

LEGAL

Spray Suit Appealed: Scientific Supply Co. (Denver) is appealing to the Colorado supreme court an award by a district court of $3,500 to a man allegedly made ill by use of an insecticide.

District Judge H. Joe Rawlinson awarded the sum to Max A. Zelinger, vice-president and treasurer of Ellis Canning Co.

Zelinger—who had sought $10,000—asserted he became ill after spraying four of the company's offices with Scientific Supply's "Control 56" insecticide. His personal physician testified that the linings of Zelinger's heart and lungs were irritated by the insecticide.

Scientific Supply introduced labels showing its "Control 56" is composed of 0.06% piperonyl butoxide, 0.05% pyrethrins, and 98.9% petroleum distillate, and witnesses for the defendant said the label met both federal and state regulations. Other witnesses testified that the various ingredients of the insecticide were harmless.

David Ginsburg, president of Scientific Supply, requested an appeal.

•

Systox vs. Systoban: Chemagro Corp. (New York) has filed a trademark infringement suit in U.S. district court (Charleston, W. Va.) against Chemical Formulators (Nitro, W. Va.).

U.S. District Judge Ben Moore is asked by Chemagro to enjoin the defendant from use of the name

PERMUTIT® presents the

VALVELESS FILTER

Completely Automatic Gravity Filter Costs Less than Manual Unit

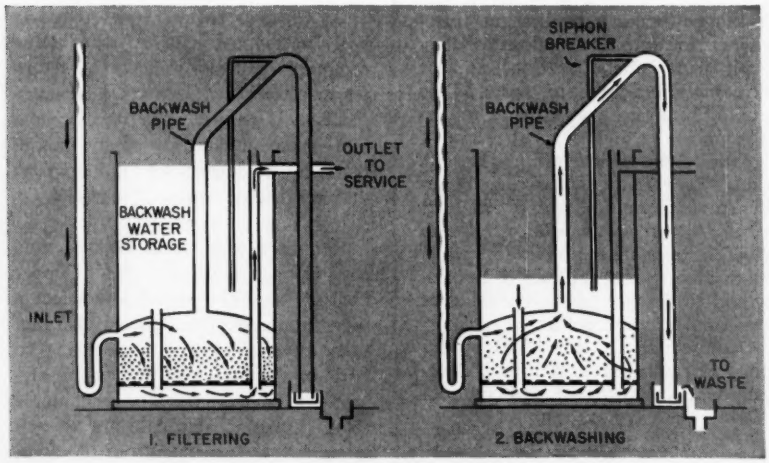
Uses no valves, no pumps, no flow controllers

Here's an entirely new concept in water filters for cities, factories and power stations: a filter that *eliminates* operation and maintenance expense . . . yet costs *less* than a conventional manually-operated gravity filter of the same size.

The Permutit Valveless Filter can be used wherever gravity flow is feasible. Units are now in operation providing both plant process and drinking water.

FOOLPROOF OPERATION

The Valveless Filter thinks for itself. It starts backwashing at a predetermined head loss, rinses and returns to service automatically . . . and as efficiently as an expertly operated manual filter. It assures uniform, high quality effluent because it eliminates "human error." It cannot be forced. It cannot backwash or rinse too soon or too late, too fast or too slow, too much or too little. It cannot develop a negative head and thus eliminates the chief cause of mudballs, channelling, upset beds. The absence of gravel eliminates another cause of upset beds. Backwash or rinse water cannot be accidentally run to service.



HOW IT WORKS

Filtering. Water enters at left, flows through sand, strainers and false bottom up effluent duct to service. As head loss increases during run, water rises in backwash pipe. At maximum headloss, water spills into downward section of backwash pipe and starts backwash (siphon) action.

Backwashing. Siphon draws water from storage down through ducts, up through strainers and sand to expand and wash bed, then to waste. At low storage level, air enters siphon breaker to stop backwash. Flow reverses and filtered (rinse) water flows into storage until full. All flow then goes to service.



PROVEN PERFORMANCE

Photo shows two Valveless Filters in a large industrial plant. Shut-off valves shown are not used except when taking a unit out of service.

LOW INSTALLATION AND EXPANSION COST

Filters up to 10 ft. diameter are shipped set up. Piping is simple. Future filters are easy to add since they require no additional backwash water storage or pump capacity. Filters use minimum floor space.

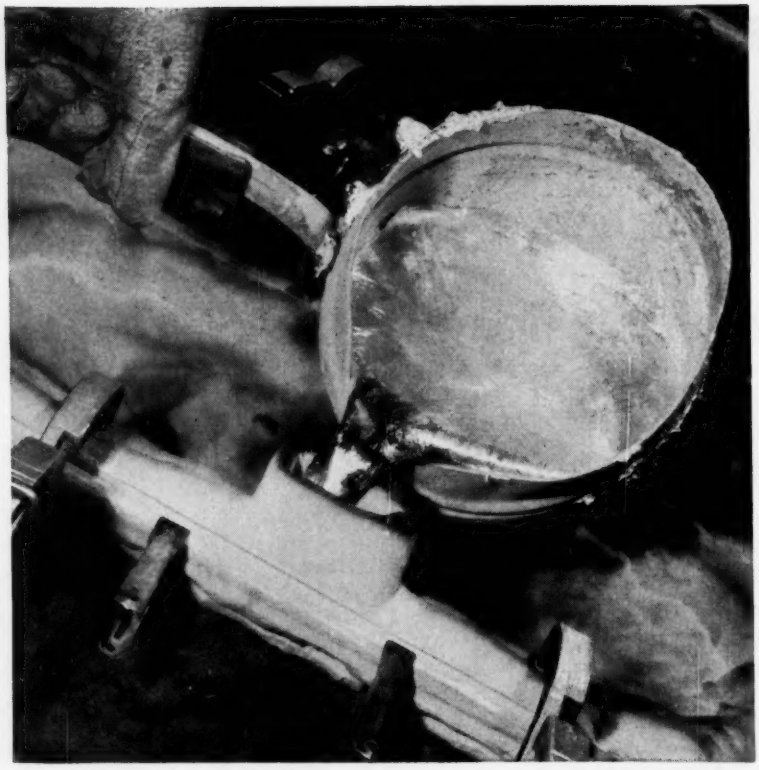
FREE BULLETIN

New bulletin, "The Permutit Valveless Filter," includes details, drawings, operating conditions, capacities. Address: The Permutit Company, Dept. CW-4A, 330 W. 42nd St., New York 36, N.Y. or Permutit Company of Canada Ltd., Toronto 1, Ont.

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Water Conditioning
Ion Exchange • Industrial Waste Treatment



HEAT RESISTANCE

. . . in phenolic resins

Among the many excellent physical properties that have earned for the phenolic resins a considerable importance in industrial processes is their resistance to heat. Whether they serve as bonds, impregnants, or coating agents, this characteristic safeguards other useful properties of the phenolics under severe thermal conditions.

In the casting of metal, for example, the hot strength of the phenolic resin enables shell molds of resin-bonded sand to withstand temperatures as high as 3200°F. for periods of time sufficient to allow complete solidification of the metal. In friction materials such as automotive brake linings the resin and fillers form a dense molded product... as a heat-resistant binder, it exhibits the stability required for service at elevated temperatures developed by severe and prolonged braking application. Elsewhere...in protective coatings for electronic parts, phenolic resins prevent accidental short-circuiting caused by the probing heat of the repairman's soldering iron.

As pioneers in developing phenolic resins, may we suggest that these versatile materials could have a problem-solving part in your operations? Durez phenolic resins are mechanically strong, self-insulating, and resistant to humidity and to many acids and alkalies as well as to heat and cold.

Qualified field men backed by our long experience in research and production are at your service. Let us help you.

DUREZ®

Phenolic Resins that Fit the Job

DUREZ PLASTICS DIVISION
HOOKER ELECTROCHEMICAL COMPANY
903 Walck Road, North Tonawanda, N. Y.

HOOKER CHEMICALS PLASTICS

Export Agent: Omni Products Corp., 460 Fourth Avenue, New York 16, New York

ADMINISTRATION

Systoban on an insecticide it markets and from advertising its product in a manner similar to that employed by the plaintiff in selling Systox.

According to Chemagro, the similarity of the tradenames is such as to cause confusion and damage the market for its product.

The Nitro concern is charged with falsely advertising that Systoban is a registered trademark.

The allegation is also made that Chemical Formulators is improperly cutting into the Systox market by playing down the toxicity characteristics of its product and by influencing the public to believe that the chemical character of Systoban is like that of Systox.

Judge Moore also is asked to award Chemagro damages for alleged loss of sales and goodwill.

IDEAS

Management Problem Conferences: Four areas of special interest to chemical process management will be the subjects of two American Management Assn. meetings next month.

At AMA's spring insurance conference in New York (May 8-10), insurance executives will hear a four-man panel, including U.S. Sen. Clinton P. Anderson (D., N.M.), discuss new insurance needs occasioned by the use of nuclear energy.

At Chicago (May 13-15), close to 150 business executives will attend seminars on such subjects as return on investment concept as a management tool, new product development and production, scope of the manufacturing executive's job and preparation and use of company manuals.

•

Kennecott Suggestion Plan: Kennecott Copper Corp.'s Utah Copper Division recently placed into effect a suggestion system and patent plan that calls for cash awards amounting to 25% of the estimated first year's savings for suggestions and patentable ideas. The plan also calls for awards to employees for suggestions the company undertakes to patent.

•

Centralization Move: Recently merged Heyden Newport Chemical Corp. is centralizing its management force by shifting its Newport Industries divisional headquarters from Park Ave. to Heyden's Madison Ave. offices—all within Manhattan.

Where low odor is a factor

use these SHELL SOLVENTS

SHELL SOL 71 AND 72

. . . have no odor, are ideal for interior finishes, polishes and cleaners.

SHELL SOL 140

. . . a slow drying, high boiling, high flash point solvent with a very mild odor.

SHELL 360 SOLVENT

. . . faster evaporation, low odor.

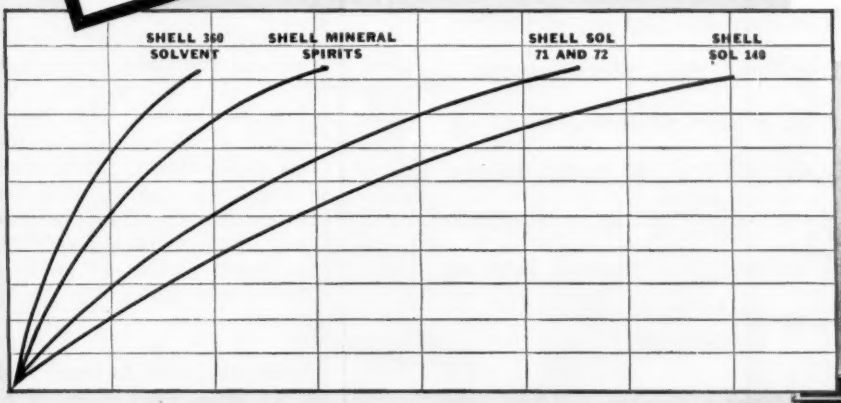
SHELL MINERAL SPIRITS

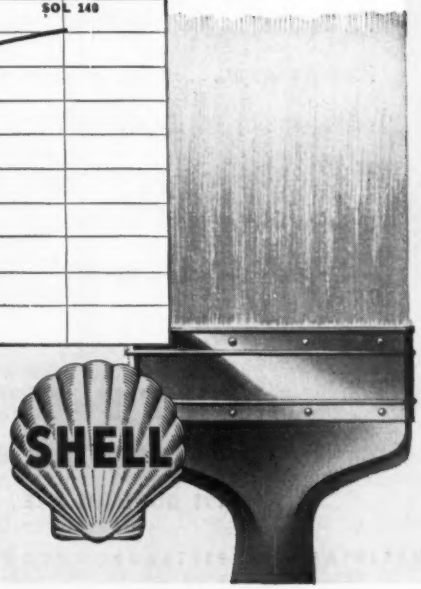
. . . conventional distillation range, solvent power and drying. Mild odor.

These solvents are recommended for low odor and odorless products.

Detailed specifications of these Shell Solvents are contained in booklet shown. It will be mailed on request.

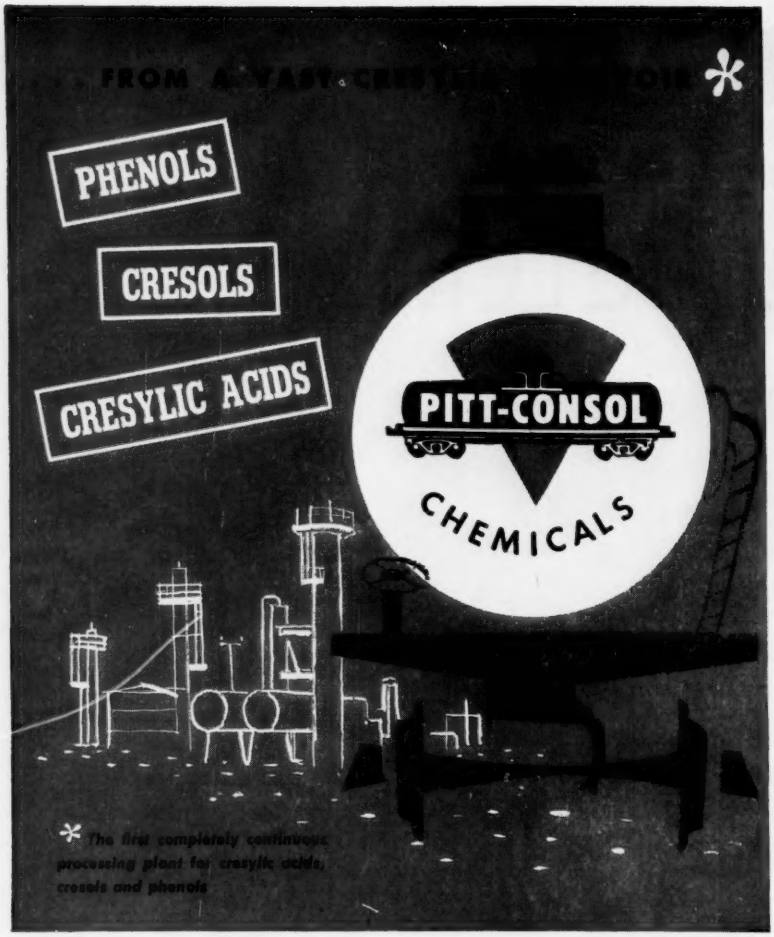






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For your cresylic needs come to PITT-CONSOL! Whatever your end use—phenolic resin, detergent or metal cleaner . . . disinfectant, pesticide, weed killer . . . pharmaceutical . . . flotation agent . . . oil or gasoline additive . . . solvent or other—specify PITT-CONSOL. You'll get prompt delivery of highest purity in the quantities you require, today *and* tomorrow. For more information or complete technical assistance, please write or call.

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A SUBSIDIARY OF PITTSBURGH CONSOLIDATION COAL CO.



WIDE WORLD

GOVERNOR McNICHOLS: Within a week, two hikes in worker benefits.

LABOR

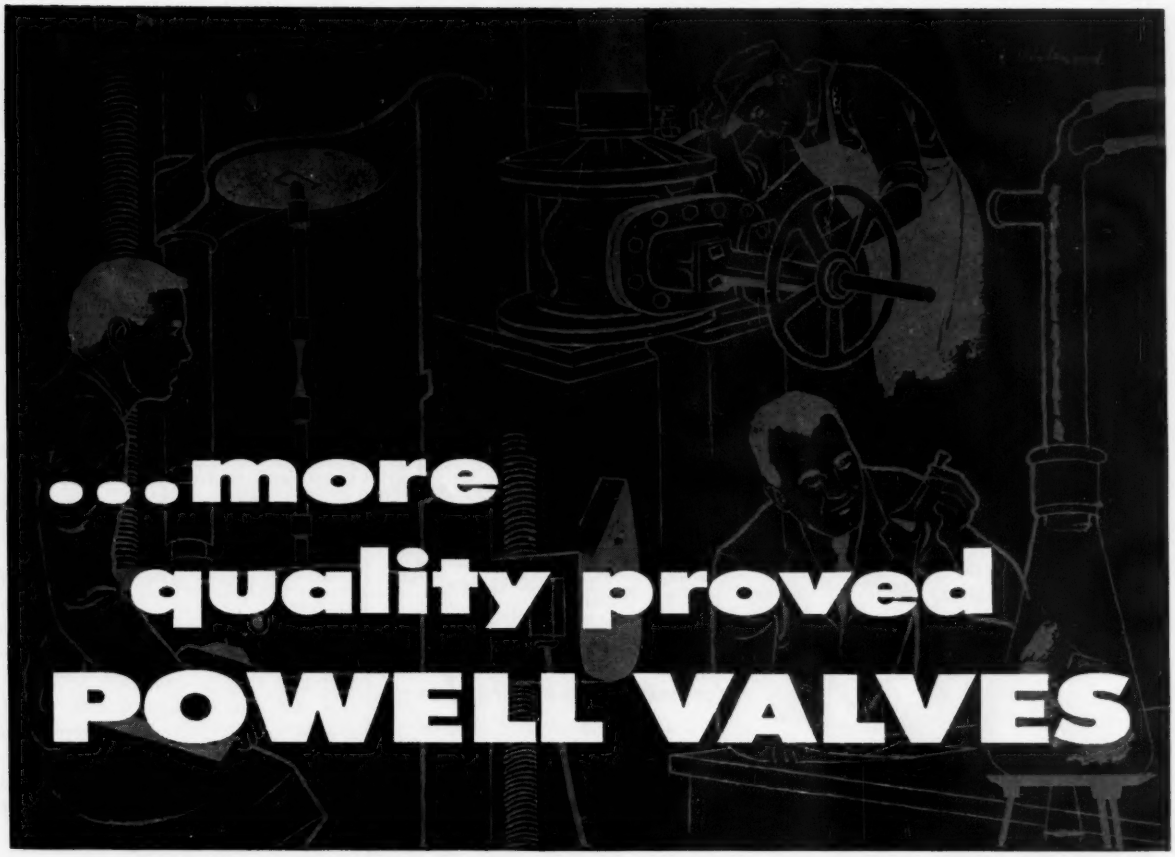
Worker Benefits Rising: Trudging upward along the trail already blazed by the cost of living are employee benefits required by law in the various states. In Colorado, two such benefits were boosted by the legislature in short order. Within a week after signing into law a bill increasing maximum workmen's compensation payments from $31.50 to $36.75/week, Gov. Stephen McNichols put his signature on a measure raising the state's unemployment compensation payments from $28 to $35/week and extending the period of coverage from 20 to 26 weeks. However, Colorado's legislators turned down a proposal to set a $1/hour minimum wage rate.

•

Pigment Workers Vote 'No': At Louisville, employees of Kentucky Color & Chemical Co. have rejected an organizing bid by International Chemical Workers Union (AFL-CIO). Voting in the National Labor Relations Board election: 10 ballots for ICWU representation, 79 for "no union."

•

Union Accused of Restraint: A civil suit that might crack secondary boycotts and lead to an end of labor unions' antitrust immunity has been filed by the U.S. Justice Dept. The complaint charges that a local union, a glass company and several "co-conspirator glazing contractors" conspired to restrain trade by preventing the use of preglazed products—windows and



...more quality proved POWELL VALVES



FIG. 2309—Flush Bottom Tank Valve for 150 Pounds W.P.

FIG. 2491—Stainless Steel O.S.& Y. Gate Valve for 150 Pounds W.P.

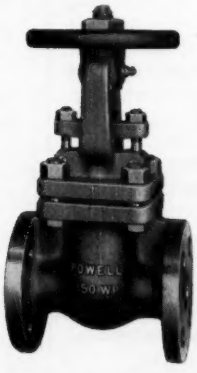
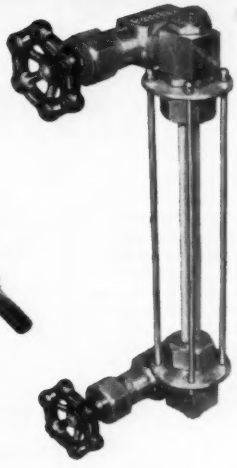


FIG. 1886—Stainless Steel Liquid Level Gauge for 350 Pounds W.W.P. Offset pattern.

FIG. 2107—Stainless Steel "Y" Valve for 150 Pounds W.P.

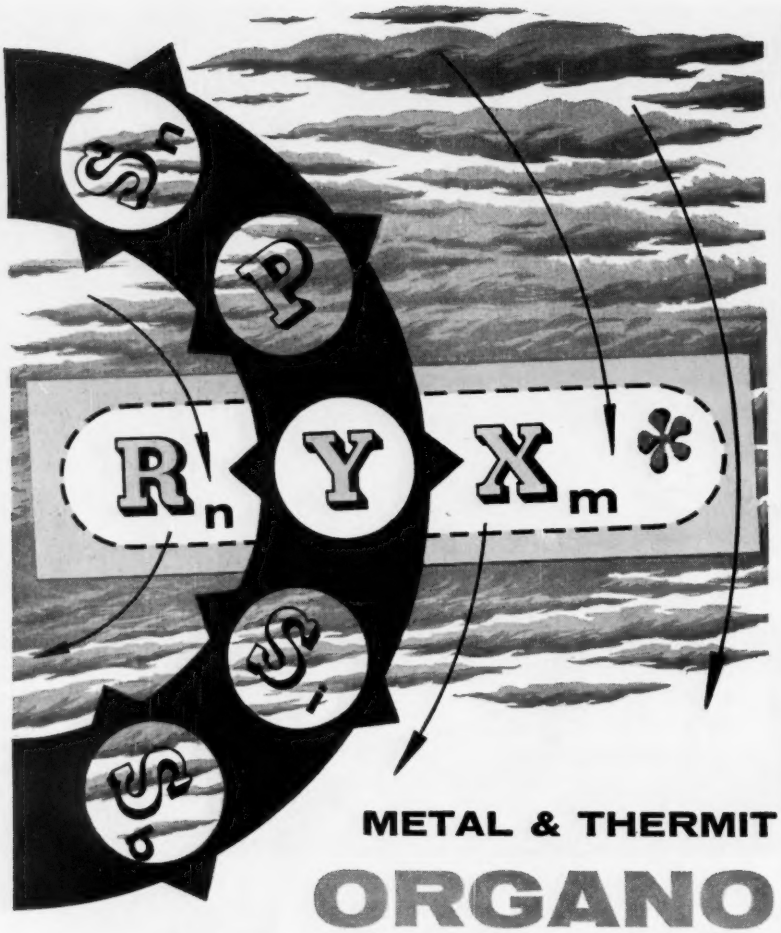




for dependable flow control

Consult your Powell Valve distributor for full facts about quality proved bronze, iron, steel and corrosion-resistant valves. For every flow control problem—there is a Powell Valve to solve it.

THE WM. POWELL COMPANY, CINCINNATI 22, OHIO . . . 111th YEAR



METAL & THERMIT

ORGANO METALLICS

*R_nYX_m—In this formula R may be alkyl or aryl; Y represents the metallic element, and X an electronegative group such as halogen, oxygen in substituted groups of the alkoxide, acid radical or hydroxide type, or electronegative sulfur-containing groups. n+m must equal valence of Y.

Metal & Thermit has developed a greater variety of organo-metallics for commercial use than any other single company. The world's foremost producer of organotins, Metal & Thermit now offers an expanded line of compounds including those of phosphorous, antimony and silicon. A unique plant devoted exclusively to the production of these organo-metallics is in full operation in New Jersey. Scheduled for early 1958 completion is an even larger organo-metallic plant near the new chemical production center at Carrollton, Kentucky. Backing the entire expansion program is the Metal & Thermit research organization which includes personnel experienced in developing organo-metallics from all metals investigated to date.

Inquiries on organo-metallic compounds of tin, antimony, phosphorous, silicon or other metals will receive our prompt attention.

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METAL & THERMIT CORPORATION

GENERAL OFFICES: RAHWAY, NEW JERSEY

METAL & THERMIT—UNITED CHROMIUM OF CANADA, LIMITED • REXDALE, ONT.

ADMINISTRATION

other glass items assembled and fitted in factories rather than on construction sites—in the Chicago area. The government is asking for an injunction decree that could involve recognition of the principle that an employer who yields to a union's illegal demands is a conspirator.

•

Wage Hikes, U.S. and Canada: Latest chemical process pay settlements have been for increases in the neighborhood of 6%. Sampling of new contracts:

- At Niagara Falls, N.Y., a two-year pact between Great Lakes Carbon Corp. and District 50, United Mine Workers, with a 6½% general wage increase now and a wage reopener next March.
- At Calgary, Alberta, a one-year agreement between Canadian Industries Limited and the International Chemical Workers, providing for wage increases ranging from 5% to 7%.
- At two sodium sulfate plants owned by the Saskatchewan provincial government at Bishopric and Chaplin, a two-year contract with Oil, Chemical & Atomic Workers Union calling for a 12¢ increase each year.

KEY CHANGES

R. S. Bradshaw, to president; **C. H. Praeger, Sr.,** to vice-president; and **J. J. Rutherford,** to secretary-treasurer; Bradshaw-Praeger & Co. (Chicago, Ill.).

Anthony J. Simonson, to market development manager, Thiokol Chemical Corp. (Trenton, N.J.).

Samuel S. Naistat, to manager, inorganic and physical-chemical research and development, Becco Chemical Division, Food Machinery and Chemical Corp. (Buffalo, N.Y.).

William P. Orr, to assistant general manager, Plastics Division, Celanese Corp. of America.

George E. Hulse, to director, Plastics Research Dept., Spencer Chemical Co. (Kansas City, Mo.).

William E. Zander, to director, Kelite Corp. (Berkeley Heights, N.J.).

Carroll Karkalits, to supervisor of research, Petro-Tex Chemical Corp. (Houston, Tex.).

IMPROVED MAGNESIA COMPOUNDS

for both industrial and chemical applications

THE UNIFORMLY HIGH QUALITY OF MICHIGAN CHEMICAL MAGNESIA COMPOUNDS can solve many of your quality control problems. This uniformity and purity stem from the natural excellence of native brines coupled with Michigan Chemical Corporation's extensive production facilities and experience. Our controlled process with minimum impurities assures you of a high MgO content.

You can rely, too, on uninterrupted deliveries of all types and quantities of magnesia compounds. Expanded plant capacities assure prompt, efficient service. Whatever your requirements — fillers, catalysts, or conditioners — you'll find Michigan Chemical a dependable source of supply.

TYPICAL ANALYSES OF MICHIGAN MAGNESIA COMPOUNDS

	No. 1 Calcined Magnesite	No. 5 Calcined Magnesite	No. 15 Calcined Magnesite	No. 30C Light Calcined Magnesia	No. 40 Extra Lt. Calcined Magnesia	Basic Magnesium Carbonate	(NF Grade) Magnesium Hydroxide	(Tech. Grade) Magnesium Hydroxide
Bulk density, weight per cubic foot	60 lb.	28 lb.	24 lb.	8½ lb.	5 lb.	5.5 lb.	15 to 25 lb.	app. 20 lb.
Ignition loss:	0.5%	1.5%	2.5%	1.9%	3.0%	56.5%	PASSES N. F. X SPECIFICATIONS	31.4%
Chloride (as Cl):	0.08	0.1	0.2	0.25	0.25	0.1		
Analysis, ignited basis:						NOT IGNITED		NOT IGNITED
SiO_2	0.3	0.3	0.3	0.3	0.3	0.15		0.20
Fe_2O_3	0.2	0.2	0.2	0.2	0.2	0.08		0.15
Al_2O_3	0.2	0.2	0.2	0.2	0.2	0.08		0.15
CaO	1.0	1.0	1.0	1.0	1.0	0.7		0.7
Mn				0.01	0.01	0.00		
Free Moisture						1.5		2.0
Screen test: Through 200 mesh		95%		99.9%	99.9%	99.99%	99.0%	99.0%
Screen test: Through 325 mesh			99.5%	99.5%	99.5%	99.5%		

M-57-1

*Reg. U. S. Pat. Off.

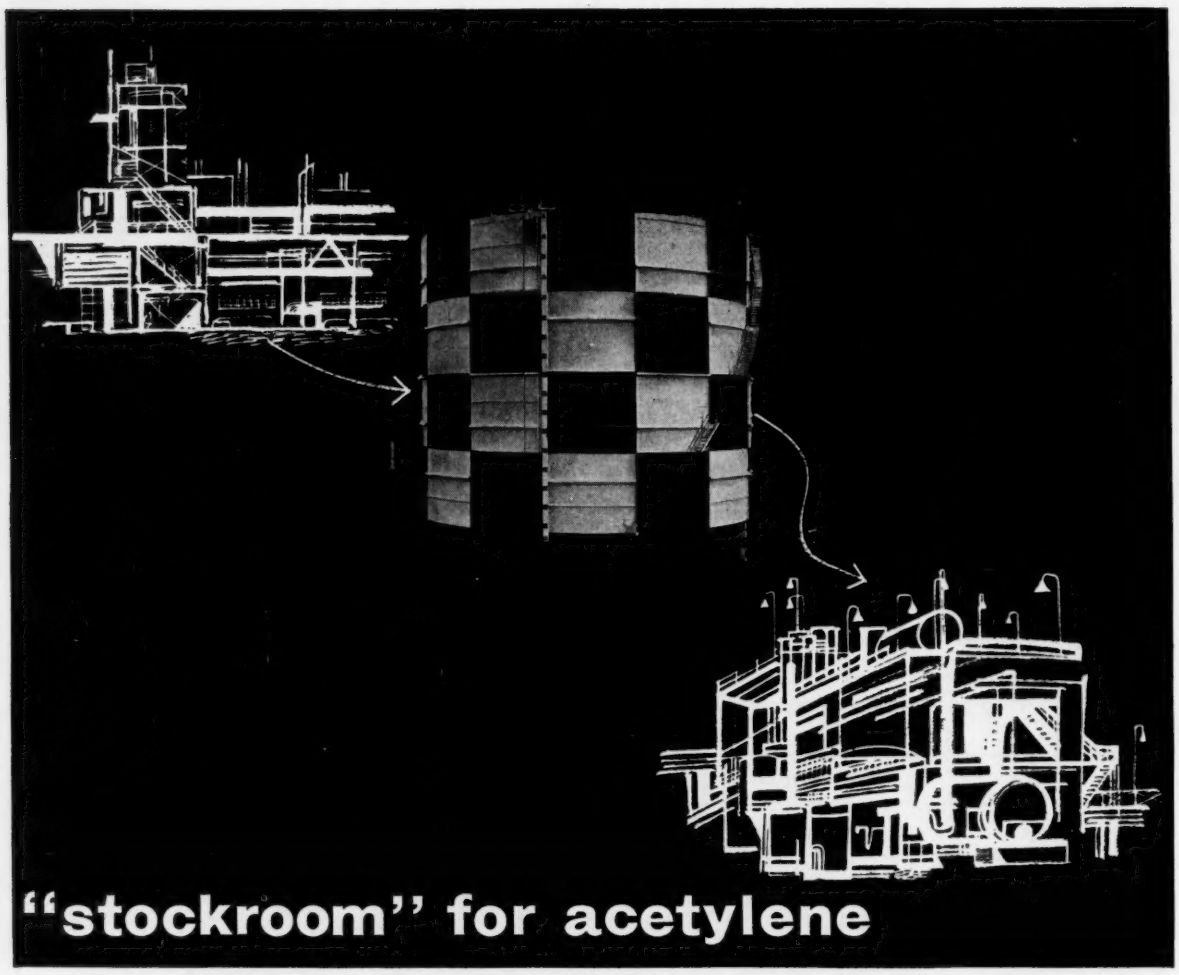
Michigan Chemical magnesia compounds now serve the textile, ceramic, rubber, glass, paint, rayon, food, pharmaceutical and other industries. Write for the Michigan Chemical technical data and specifications on magnesia compounds as well as information on other Michigan Chemical products.

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BASIC MANUFACTURER OF INDUSTRIAL, AGRICULTURAL, AND PHARMACEUTICAL CHEMICALS RARE EARTH OXIDES, COMPOUNDS, AND METALS



Linde purchases Wiggins Gasholder for storage of acetylene between production and use cycles

When Linde Air Products Company's new acetylene plant in Montague, Michigan goes "on stream", a new 100,000-cubic-foot Wiggins Gasholder will play a vital role in the operation. Every cubic foot of acetylene produced will pass through the "stock-room" on its way to DuPont for use in the production of Neoprene. The gasholder will provide acetylene storage and will serve as surge capacity to enable Linde to satisfy both normal and emergency requirements.

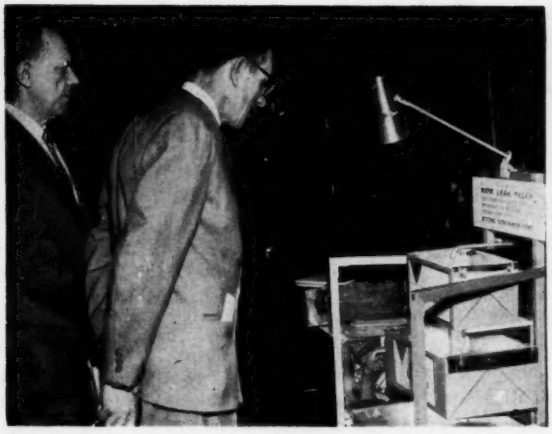
If you produce, store or use gases, investigate the advantages of Wiggins Gasholders. They can be built to any capacity—from 50-cubic-feet to a million. Call or write General American for complete information.

WIGGINS VAPOR SEALS GENERAL AMERICAN TRADE MARK

GENERAL AMERICAN TRANSPORTATION CORPORATION

135 South La Salle Street, Chicago 90, Illinois.

Offices in Principal Cities



1. Drug use looms for these foil-laminated cartons.



2. Even chimps can accurately use metered packages.

Packaging Progress Goes on Parade

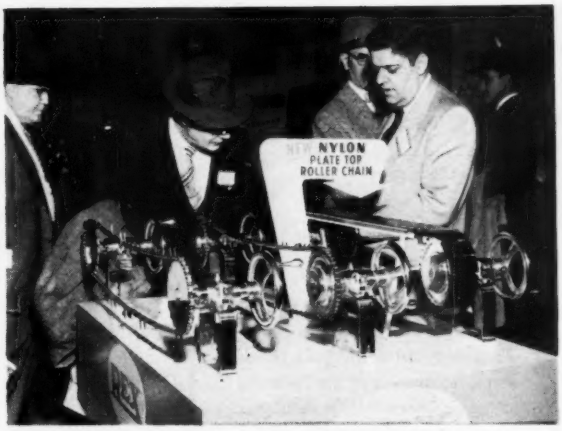
Thirty minutes before showtime last week, CHEMICAL WEEK toured the echoing aisles of the American Management Assn.'s National Packaging Exposition at Chicago's International Amphitheatre. Compressed air hissed and conveyors clanked before an impatient vanguard of an anticipated audience of 30,000. For the chemical industry, these were the interesting new ideas:

Films: Three new Du Pont films will fill a wide range of packaging needs. Nonfogging, polymer-coated cellophane, K-203, resists wrinkling, oil and greases, is impermeable to gases. A polymer-coated Mylar will permit heat-sealing (regular Mylar requires adhesives). Another type of Mylar shown featured a built-in heat shrinking property.

Word of a price cut and a 150% expansion of Vitafilm production came from Goodyear Tire & Rubber. The firm expects the product, now used as a textile wrap, to find more markets soon. At the Bakelite booth, the big news was stiffer polyethylene film and a sealing system for overwrap equipment.

Cartons and Containers: Aluminum foil-laminated corrugated boxes, developed jointly by Stone Container Corp. and Alcoa, dominated carton interest (*see cut No. 1*). Water tightness and remarkable insulative ability make the carton a natural for shipping pharmaceuticals and other refrigerated products. Also on display: Hudson Pulp & Paper's new foil-wall multiwall (*CW, Jan. 19, p. 40*). It offers some metal drum advantages to chemical shippers.

Several items at the Gaylord Container exhibit drew interest from chemical packagers. Octagonal corrugated containers are already making substantial savings on



3. Snap-on links convert roller chains to conveyors.



4. Low-cost aerosol filler gets first show tryout.



It's better to get it from Eastman . . .

Sure, when you need an uncommon organic (or an uncommonly pure one) in more-than-test-tube and less-than-tank-car quantities, try Eastman Organic Chemicals Department, *Distillation Products Industries,* Rochester 3, N. Y.

there are some 3500 Eastman Organic Chemicals for science and industry

DISTILLATION PRODUCTS INDUSTRIES
is a division of
EASTMAN KODAK COMPANY

shipments of activated alumina for Reynolds Metals. A polyethylene liner prevents moisture-vapor absorption. Received in knocked-down form, the drums are thrown away when emptied by the customer. A similar drum that has replaced wooden barrels for glassware shipments could possibly be used by apparatus companies. Reclosable corrugated boxes with polyethylene liners were offered for use when only part of the contents are used at a time. And a new type of bracing for water-heater containers should soon bid for shipping processing equipment. Gaylord also displayed a corrugated container for shipping up to 2,700 lbs. of synthetic rubber. Reinforced with rayon tape, the container permits lift-truck handling of 30% more bales at a time, saves 20 manhours in unloading freight cars.

Metered cartons also attracted interest. U. S. Metered Container Corp. demonstrated that "anybody" can use such containers to deliver 97% accurate dosage. Even the chimp (*see cut No. 2, p. 113*) found it no trick.

Closures and Labels: Tremendous attention by drug and specialty producers centered on W. Braun Co.'s new Squeez-N-Turn cap. The device, a double cap, promises to keep drugs, bleaches, etc., out of children's stomachs. The inner cap screws onto the bottle; the outer shell turns freely. Unless the outer shell is compressed, the inner cap cannot be removed. Young children aren't strong enough to compress the outer shell. Conventional capping equipment can be used.

Promotional labels, keyed to merchandising events, were launched by Allen Hollander Co. Pressure-sensitive, they can be removed without damaging the package.

Kleen-Stik Products introduced an automatic applicator for pressure-sensitive adhesive strips.

Better Packages, Inc.'s new entry was the Boxize Tap-O-Matic. It provides for measuring, feeding and moistening of automatic tape in carton-sealing operations. The firm's Nike was also introduced. A single downward stroke dispenses and wraps tacky tape around polyethylene bags and cuts the strip.

Champion Paper & Fibre's new, coated folding board can be printed with gloss inks by lithograph, letterpress or gravure.

Heat-transferred labels for cellophane bags and machinery for application are new with Dennison Mfg. Co. Therimage labels applied by Imagraph stick to surfaces, make small runs possible.

Machinery: New, compact trimming presses for "bubbles" and other plastic carded items were at Washington Steel Products' booth.

Interest-getter at Schroeder Machines Corp.'s booth was a new case opener. It takes a flat case from the magazine, opens and forms the case, applies adhesive to the flaps and seals the bottom.

Automatic Outsert applicators that fit into production lines were announced by Pfaudler. The machine tapes leaflets to containers in cylindrical, flat-sided or tapered shapes at speeds up to 220 units/minute.

In automatic web-guiding equipment, Fife Mfg. Co. added two items to its line: an automatically shiftable cable for unwinds that converts machines to automatic guiding from the unwinds; a power unit that can simultaneously handle more than one guiding unit.

Roller chains (*see cut No. 3, p. 113*) can now be converted to suitable conveyors for bottles and packages. Key: snap-on nylon links (displayed at the Chain Belt stall) that give the rollers a flat surface. The links resist corrosion and wear.

In aerosols, Mojonnier's low-cost filling unit (*see cut No. 4, p. 113*) was shown in operation at a packaging show for the first time. It was introduced last year, is stirring specialty producer interest.

Refinements marked the progress of versatile split-roll, side-weld polyethylene bag machines. In G. T. Schjeldahl Co.'s version, two electric-eye systems make it possible to run four printed webs simultaneously on a single-draw roll. And Delro Industries was making the claim of the "world's fastest" for its new bag-forming machine. Its speed: 100 18x24-in. polyethylene bags formed every minute.

Gardner Board and Carton Co. took occasion of the exposition to unveil its Glaspak, a device claimed to be the first to combine in-line packaging and a window in a single carton. Fully automatic, it packages about 20 cartons/minute.

5086

HIGHEST STRENGTH ALUMINUM FOR UNFIRED PRESSURE VESSEL FABRICATION

Kaiser Aluminum now offers you alloy 5086 . . . the highest strength aluminum alloy available for the fabrication of unfired pressure vessels.

Non-heat-treatable 5086 is designed specifically for welded structures requiring maximum joint strength and efficiency, plus light weight and corrosion resistance.

And, with high-strength 5086 you can take advantage of inert-gas, shielded-arc welding methods for faster welds and pressure tight joints.

Development of 5086 by Kaiser Aluminum makes possible many new applications of light weight, durable aluminum for the chemical and petroleum industries. Find out now how this versatile alloy can serve you.

For complete information, call the Kaiser Aluminum sales office listed in your phone directory. Process Industries Department, Kaiser Aluminum & Chemical Sales, Inc., *General Sales Office,* Palmolive Bldg., Chicago 11, Illinois; *Executive Office,* Kaiser Bldg., Oakland 12, California.

PHYSICAL CHARACTERISTICS OF ALLOY 5086

Typical mechanical properties in various tempers

	Temper			
	"0"	H32	H34	H112
Tensile strength (psi)	38,000	42,000	47,000	39,000
Yield strength (psi)	17,000	30,000	37,000	19,000
Elongation (% in 2")	22	12	10	14

Allowable design stress values

	For metal temperature not exceeding deg. F.	
Condition (temper)	100°	150°
Annealed	8700 psi	8700 psi
H112	8700	8700
H32	10,000	9900
H34	11,000	10,800

Allowable stress values for welded construction compared with other alloys

Alloy Designation		For metal temperature not exceeding 150° F. (annealed condition)
AA	ASTM	
1160	996A	1650 psi
1100	990A	2350
3003	M1A	3150
3004	MG11A	5650
5050	G1A	4000
5052	GR20A	6250
5154	GR40A	7350
5086	GM40A	8700

Nominal composition

4.0% magnesium
0.45% manganese
0.10% chromium

Typical weld strengths (specimens tested across the weld)

37,000 psi tensile strength
18,000 psi yield strength
13% elongation

Kaiser aluminum 5086 is available in flat and coiled sheet, plate and extrusions.

Kaiser Aluminum

materials for the process industries

See "THE KAISER ALUMINUM HOUR." Alternate Tuesdays, NBC Network. Consult your local TV listing.



CARBORUNDUM'S engineer determines answer to service problem.

Carborundum is launching technical service by mail; customers fill in blank, company returns recommendations.

The idea could revive chemical industry interest in mail-order service.

Technical Service by Mail?

Up to now, mail-order technical service has failed to win a place in the chemical process industries. But if Carborundum's new venture proves out, mail-order service seems certain to get careful scrutiny from executives facing rising costs and manpower shortages.

Carborundum has come up with a system that permits prediction—by correspondence — of abrasive belt grinding economics in metal processing and recommendations for belt use. The idea, dubbed Maximum Automation Potential (MAP), is the inspiration of the firm's Coated Abrasives Division, may be extended to other company divisions.

How It Works: Company engineers set up the method by classifying a big backlog of case histories, technical studies and other data, isolating common factors and variables. This data was then reduced to mathematical formulas applicable to virtually all field problems.

Customers fill out a standardized form (*see cut*) and mail it in for processing. Carborundum returns specific recommendations on such items as machine type, belt size, grit size, coolants and contact wheels, also gives data on labor and overhead costs.

MAP supplements, does not replace, regular technical field service calls. When a recommendation involving large dollar outlays is made, field engineers and salesmen will still likely make personal calls, set up means to prove the validity of the suggestions.

Mail-order service, believes Carborundum, offers these advantages.

- The problem comes to the expert, not the expert to the problem.
- Customers, in effect, get an abrasive belt specialist "on the staff" but not on the payroll.
- Company engineers can avoid myriads of in-plant visits, can reach more customers by mail than by personal calls.
- The service is probably faster than field calls because customers must often wait until a call can be scheduled.
- Salesmen can more easily pursue regular schedules, make fewer emergency service calls.
- Analysis and recommendations are claimed to be accurate within 10%.

Because the program is brand-new, Carborundum doesn't yet know what additional data customers may have to furnish, or what bugs may turn up. But the firm expects that very little additional data-gathering will be necessary. Regular calls by salesmen and field engineers (when needed) will avoid loss of the "personal touch." And incorporation of data on new developments into the system will prevent its obsolescence.

Chemical Cue: How applicable would a similar approach be for chemical technical service? At this moment, it's hard to say. Much chemical technical service involves formulation and numerous process and product variables. Hence, Carborundum's method —devised essentially for a mechanical problem—wouldn't appear too adaptable.

But, though mechanical, MAP involves quite a few variables itself (abrasive, labor and overhead costs, type of machine, characteristics, coolants, etc.). Chemical companies have increasingly been adopting mechanical and electronic means of storing, filing and manipulating technical data (*CW, Nov. 3, '56, p. 44*).

These factors, added to pressures stemming from lack of manpower and mounting service requests, could well presage a future for mail-order technical service in the chemical and chemical process industries.

Carborundum plans to get MAP off to a fast start. An extensive advertising and publicity campaign to the metal working industry is now under way. Direct mail, too, will be used. Basic idea: to encourage customers and potential customers to write for a special MAP brochure containing the 10-question* fill-in form. At present, the company's distribution of the forms will be centered on the advertising drive. But salesmen may leave batches of the brochures at customer plants during visits and when the firm's mobile abrasive workshop makes a call.

*Questions: Size or shape of item, with accompanying illustrations; type of metal to be ground; areas to be ground; metal to be removed; estimated piece handling time; dollar labor rate; dollar overhead rate; present or desired production rate; new installation or operation; estimated total operating cost.

"You get prompt delivery... when you specify Du Pont Methanol"

"Our agents for Du Pont Methanol are especially selected for their strategic locations throughout the country," says Jack Mace, Du Pont Polychemicals Salesman for the Newark, N. J., territory. "This is an important factor insuring fast delivery when you need it most. You get topnotch service, too, because each agent has the equipment and manpower to handle your order quickly and efficiently.

"And that's not all . . . Du Pont Methanol is a quality product of proven performance and uniformity. Some of our customers use Du Pont Methanol as an extractant for animal and vegetable oils. Others, as an intermediate for certain plastics and plasticizers. Still others, as a solvent for quality finishes. And many other uses are growing continuously."

If you are now using methanol or are considering using it, remember Du Pont's leadership in the production of synthetic methanol for the past 25 years. It's your assurance of a top-quality product, whether you buy in drum or tank-car lots.

Just clip and mail this coupon . . . we'll be glad to send you complete specifications of Du Pont Methanol and the name of our agent nearest you.

DU PONT
REG. U.S. PAT. OFF.

BETTER THINGS FOR BETTER LIVING
...THROUGH CHEMISTRY



JACK MACE is sales representative for the Du Pont Polychemicals Department in the Newark, New Jersey, area. He's a native of Cleveland, Ohio, and earned his Bachelor of Science degree in Mechanical Engineering at Southern Methodist University. Jack works closely with our customers on their problems and helps them determine their chemical requirements.

FOR ADDITIONAL INFORMATION ON SPECIFICATIONS, PROPERTIES AND USES, MAIL THIS COUPON

Which of these other chemicals are you interested in?

- ☐ ADIPIC ACID
- ☐ CRYSTAL AND SHOTTED UREA
- ☐ DIGLYCOLIC ACID
- ☐ HEXALIN® CYCLOHEXANOL
- ☐ HYDROXYACETIC ACID
- ☐ HYTROL® O CYCLOHEXANONE
- ☐ LOROL® FATTY ALCOHOLS

E. I. du Pont de Nemours & Co. (Inc.)
Polychemicals Dept. 2-4-20, Wilmington 98, Del.

Please send me full information on Du Pont Methanol and the name of your nearest agent. I am particularly interested in using methanol for the following applications:

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*Firm*_____

*Address*_____

*City*_____ *State*_____

Hats off (you'll say)
to Diamond
Chlorinated Solvents



(Dichloromethane)
Practically
nonflammable



Technical grade
or U.S.P. grade



(Monochloromethane)
Resists oxidation
Thermal stability



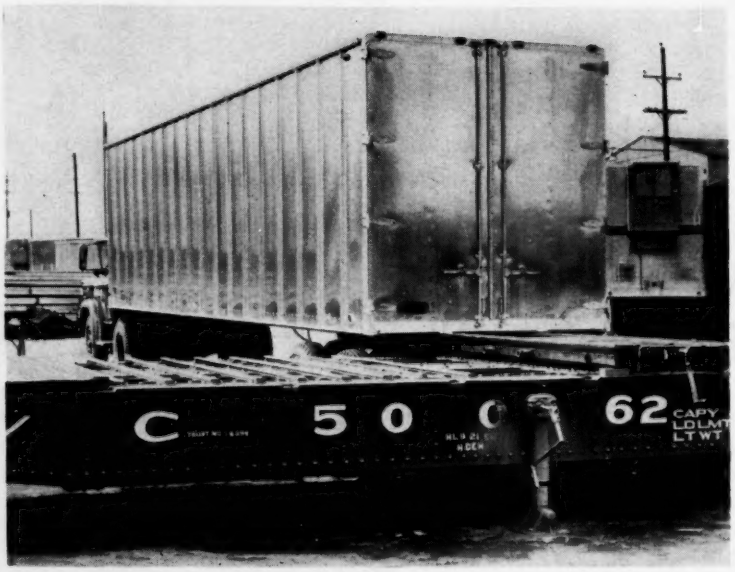
Also fire extinguisher
fluids, grain fumigants
and custom blends



For drycleaning
and metal degreasing

Phone your DIAMOND Representative
or write DIAMOND ALKALI COMPANY,
300 Union Commerce Building,
Cleveland 14, Ohio

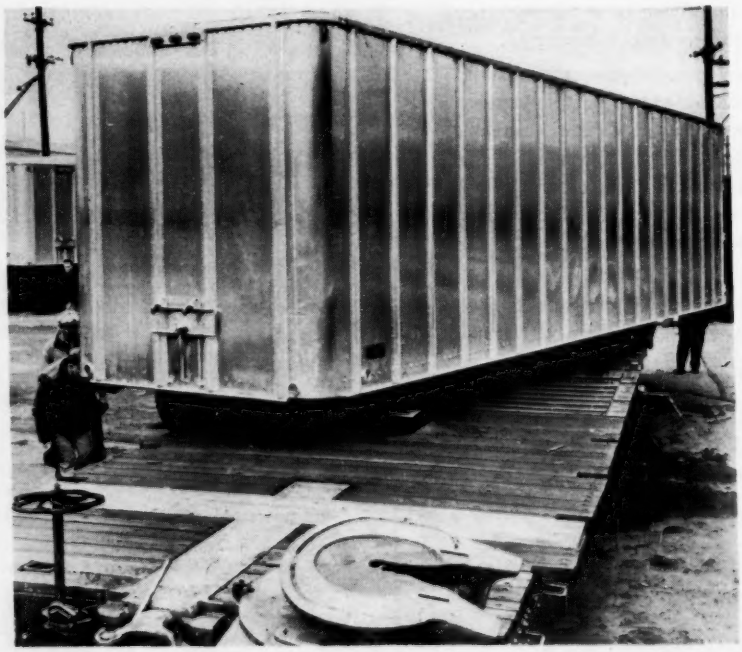
Diamond
Chemicals



Turntable Ride for Piggybacks

Wheelless piggybacking is the newest idea in transporting trailers on flat cars. Tagged "Flexi-Van Service" by its developer, the New York Central System, the method permits separation of wheel assemblies from loaded trailers, placement of trailers —sans wheels—aboard flat cars. Trailers, wheel units and flat cars, says New York Central, require only slight modifications to adapt to the system.

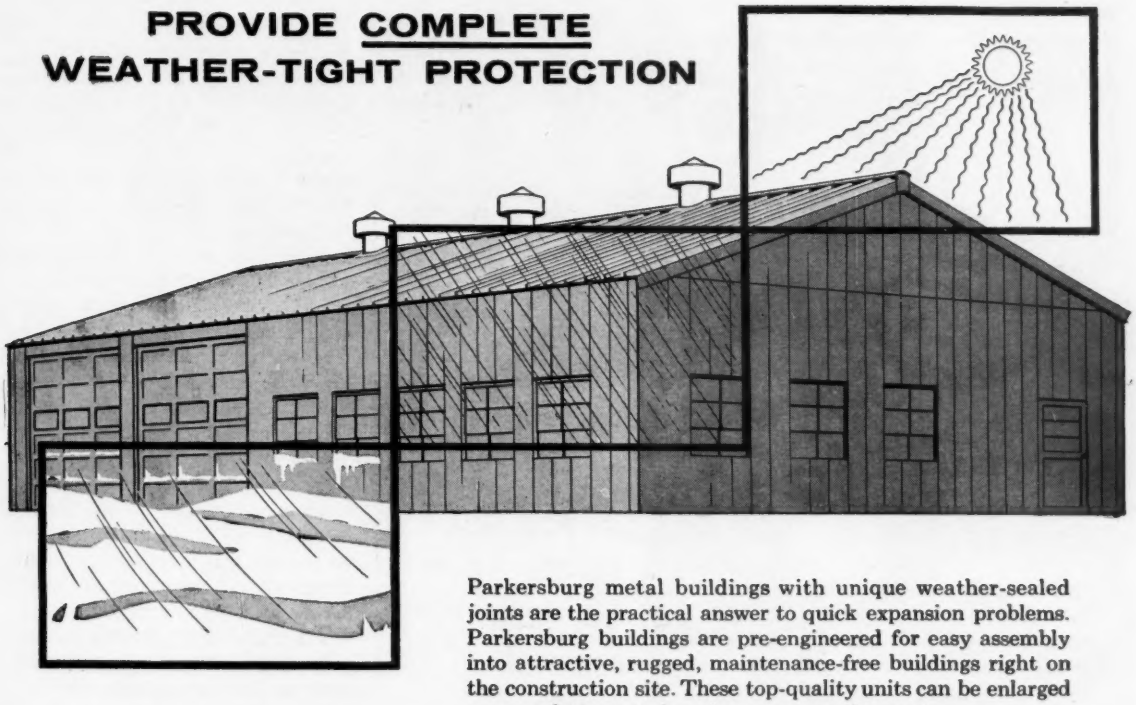
In operation, loaded trailers are backed off onto a special hydraulic lift and turntable, swung and locked into position. Advantages claimed include: faster trailer transfer; weight reduction; more efficient use of wheel units and ability to make many mass transfers simultaneously.



quality

PARKERSBURG metal buildings

PROVIDE COMPLETE WEATHER-TIGHT PROTECTION



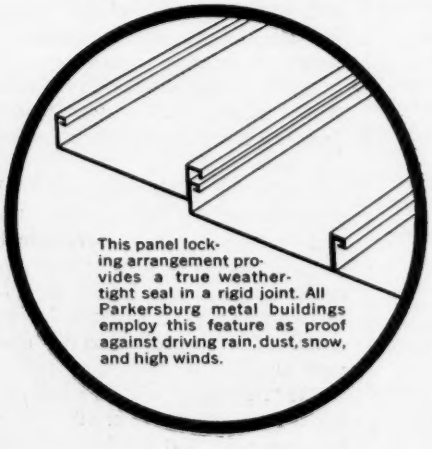
Parkersburg metal buildings with unique weather-sealed joints are the practical answer to quick expansion problems. Parkersburg buildings are pre-engineered for easy assembly into attractive, rugged, maintenance-free buildings right on the construction site. These top-quality units can be enlarged or moved to meet changing space requirements.

From tool sheds to large factory buildings Parkersburg installations are saving and serving in hundreds of different ways right across the board in industrial and commercial applications. It will pay you to look into this modern, low-cost way to provide additional facilities. Write to Department C-2.

60 Years of Successful Service!

THE PARKERSBURG RIG & REEL COMPANY
Division of Parkersburg-Aetna Corporation
Parkersburg, West Virginia

The secret is in this unique "seven-fold" joint!



This panel locking arrangement provides a true weather-tight seal in a rigid joint. All Parkersburg metal buildings employ this feature as proof against driving rain, dust, snow, and high winds.

Factory Locations:
Parkersburg, West Virginia
Pomeroy, Ohio
Coffeyville, Kansas
Houston, Texas

Building Division Sales Offices:
Dallas, Atlanta, New York, Chicago, Parkersburg

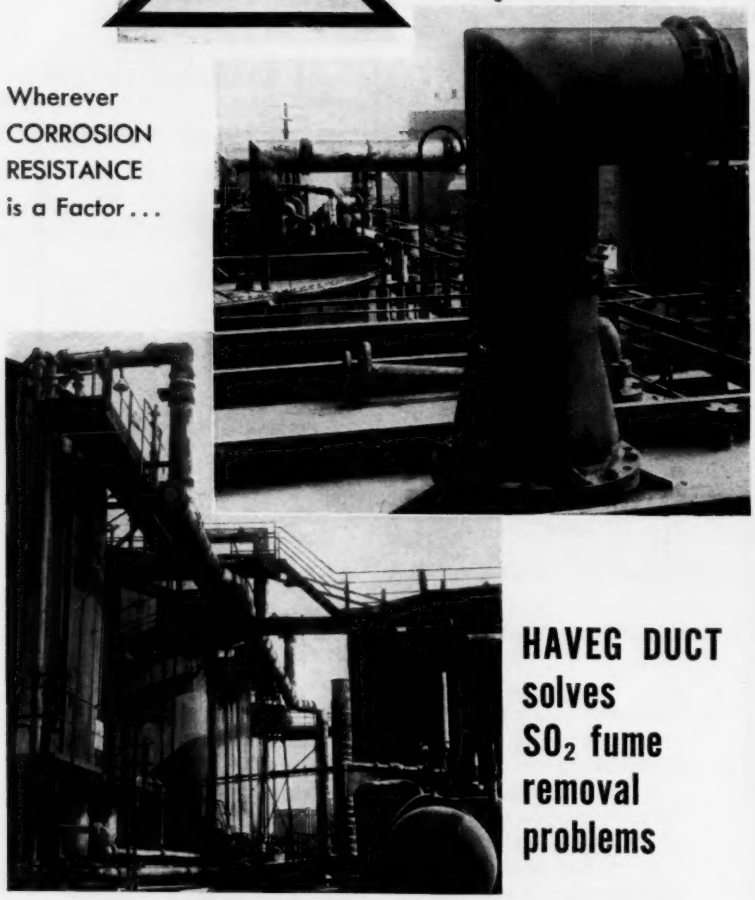
BUILDING
PARKERSBURG
DIVISION



"WISE IN THE WAYS OF METAL BUILDINGS"

HAVEG® News

Wherever CORROSION RESISTANCE is a Factor...



HAVEG DUCT solves SO_2 fume removal problems

RESISTANCE TO ACID ATTACK MAKES THE DIFFERENCE AT ATLANTIC REFINING COMPANY ACID PLANT

Production of 150,000 lbs. of sulphuric acid daily posed a major corrosion problem for Atlantic Refining Company at its Philadelphia plant. Vapors boiled off from refinery sludges during recycling operations in the recovery plant contain SO_2 concentration as high as 65% ... at temperatures up to 250°F! After testing several materials for required properties, Haveg 41 was selected for installation of the fume duct and scrubbing system pictured above. The result? No evidence of corrosion—after more than two years of continuous operation!

Haveg Performance Proved by Experience

Three 18" ducts feeding into an 18" header carry the gas to a scrubber 36" in diameter and 29' in height, also constructed of Haveg 41. Since installation of the Haveg fume removal and scrubbing system external corrosion of other equipment has been substantially reduced. Elsewhere at the plant Haveg pipe, processing vessels and duct installations have proved Haveg's exceptional resistance to corrosion, physical strength and thermal versatility for over 15 years of superior performance.

A Haveg Plastic for Every Service Requirement

No other material offers as wide a range of effective resistance to corrosive acids, hypochlorites, salts, alkalies, and solvents as the Haveg plastics. Custom design and field service assures you full advantage of Haveg's low net cost for every process installation. Let a qualified Haveg corrosion engineer help you determine the Haveg plastic and equipment design best suited for your needs ... or write for Haveg Bulletins describing the complete line of corrosion resistant equipment.

H-701

HAVEG PLASTICS OF TOMORROW SOLVE YOUR CORROSION PROBLEMS *TODAY* IN PIPING • PUMPS • PROCESS TANKS • FUME DUCTS • VALVES • HEAT EXCHANGERS

HAVEG INDUSTRIES, INC. 920 Greenbank Road, Wilmington 8, Delaware Factory: Marshallton, Del. Phone WYman 8-2271

Atlanta, Cedar 7-3821 • Chicago (Wheaton), WHeaton 8-3225 • Cleveland, WAshington 1-8700 • Detroit (Livonia), KEnwood 1-1785 • Houston (Bellaire), MOhawk 7-6519 • Los Angeles • New York (Westfield, N.J.), WEstfield 2-7383 • Seattle, Main 9006 • Denver, BElmont 7-0433 • Canada: Montreal, GLenview 7791 • Toronto, RUssell 1-5559 • Monterrey, Mexico

SALES

Scanning the Scope

What will the recently adopted "common market" and the proposed free-trade zone mean to chemical export sales? That's the question Fred G. Singer, tariff committee chairman for the New York Board of Trade's Drug, Chemical and Allied Trades Section, answers in a new study.

These points, says Singer, are indicated:

- Exports of "finished manufactures" will be most affected, and because of sharper competition, exports to world areas other than Europe may be curtailed.
- Exports of raw materials and semimanufactures may benefit.
- Establishing the single import-tariff schedule will, in effect, tend to raise the rates of low-tariff countries, lower the rates of high-level nations.
- U. S. exporters should not encounter difficulty in collecting.
- A minimum price system for trade of agricultural products between union members may be established.
- Imports from French overseas territories will receive preferential treatment, and other countries will aid development of French territories.
- Formation of customs unions is permissible under the General Agreement on Tariff and Trade (GATT).

The common market, or "Little Europe" customs union, will result in the elimination of all trade regulatory measures between member nations (Benelux, France, West Germany and Italy) and set up a single import-tariff schedule against outside countries. A Baltic customs union—for Finland, Sweden, Norway and Denmark—is also under study.

Elimination of all customs duties in common-market nations may take place in 12 years at the earliest, in 17 years at the latest. Reliable European sources, says Singer, believe that the new tariff schedule will not become effective until the end of the first four-year period.

The "free trade" scheme would link the customs unions, most other European countries and the United Kingdom. Members would eliminate trade restrictions between themselves but be free to set individual rates against outsiders. Currently, the idea is being studied by committees of the Organization for European Economic Cooperation.



Swift's exclusive process makes low cost Red Oils available to do many high quality jobs

If the red oil application you have in mind is clouded by the high cost of a superior grade, Swift may have the answer for you. The low temperature Solexol manufacturing process, used exclusively by Swift, provides positive controlled removal of impurities and selective decolorization of red oils.

For the red oil user, this process helps insure three outstanding product advantages often associated with only higher priced grades:

HEAT STABILITY. Low heat processing helps make Swift's Red Oils better able to withstand subsequent heats than red oils which have already been subjected to high manufacturing temperatures.

COLOR STABILITY of Swift's Red Oils provide a degree of uniformity to help match the most rigid color, and odor, requirements.

VARIETY. Selective extraction helps provide a variety of Swift's Red Oil products ranging from the "work horse" grades to higher quality "application pure" red oils and each is produced fresh to *stay* fresh and stay uniform to specification from batch to batch.

Yes, SOLEXOL is the reason why Swift & Company is able to offer economy priced, Red Oil #805 and #810 . . . products which will meet many of the color and stability requirements laid down for higher priced red oils. A trial order may result in savings for you. Return the coupon and remember . . .

ONE TRIAL IS BETTER
THAN A THOUSAND CLAIMS

SWIFT & COMPANY • INDUSTRIAL OIL DEPARTMENT

Oleic Acid (Red Oil) • Animal Fatty Acids •
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Swift
102ND YEAR

Serve Your Industry Better

Swift & Company, Industrial Oil Dept.
165th Street
Hammond, Indiana

Please send data on the following products:

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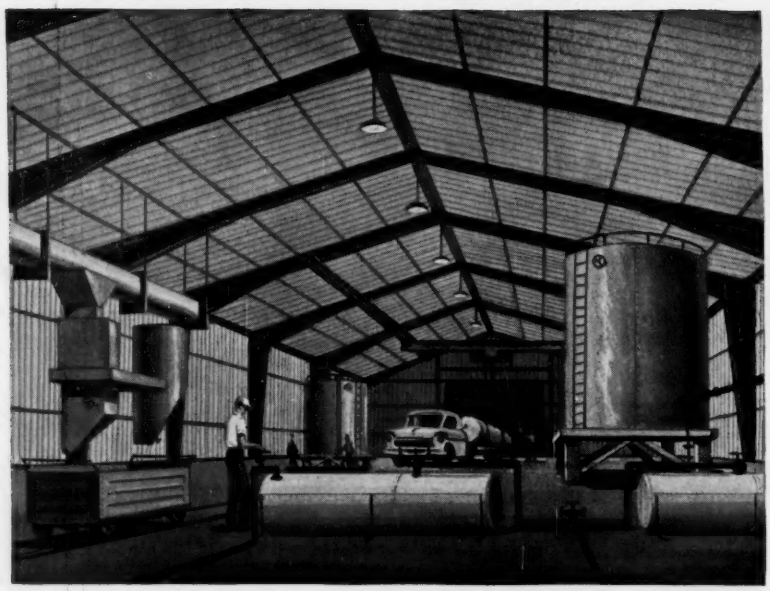
_____ ☐ Send Red Oil folder.

*Name*_____ *Title*_____

*Company*_____

*Address*_____

*City*_____ *Zone*____ *State*_____



Chemical men get rugged clear-span design, attractive *Stran-Satin* walls with NEW STRAN-STEEL BUILDINGS

The open, clear-span design of Stran-Steel buildings makes them ideal for the large tanks, vats, and associated piping required for chemical processing operations. In addition, new Stran-Steel buildings have a look of quality never before achieved in an all-steel structure.

Start with the smart *Stran-Satin* finish. *Stran-Satin* metal wall, exclusive with Stran-Steel, provides a strong, durable exterior with the weather resistance of zinc-coated steel. Special protective coatings are available for extreme corrosive conditions. Peaks, gables and eaves are completely enclosed with smart fascia flashing.

Under this attractive exterior is a rugged steel structure. At the peak and knee, the continuously welded rigid frame I-section steel plate beams are securely bolted together. Each frame is also permanently bolted to the foundation.

New Stran-Steel buildings are quickly erected at minimum cost, provide clear, unobstructed space for large equipment, and may be provided with such required accessories as overhead craneways or large access doors. With Stran-Steel buildings, you get the cost-saving features of a pre-engineered structure in a quality building that is fire-safe and easy to insulate. They are available in widths of 32, 40, 50, 60, 70, and 80 feet, and multiples thereof.

Up to $25,000 is available to finance these buildings through the Stran-Steel Purchase Plan. As little as 25% initial investment; up to 5 years to pay. Ask your Stran-Steel dealer for the complete story. He is listed in your classified telephone directory.

Stran Steel

STRAN-STEEL CORPORATION
Detroit 29, Michigan • Division of
NATIONAL STEEL CORPORATION

Here is where to obtain more information:
Atlanta 3, Ga., 206 Volunteer Bldg.
Chicago 6, Ill., 205 W. Wacker Dr.
Cleveland 16, Ohio, 20950 Center Ridge Rd.
Detroit 29, Mich., Tecumseh Rd
Houston 5, Texas, 2444 Times Blvd.
Kansas City, Mo., 6 East 11th St.
Minneapolis 4, Minn., 708 S. 10th St.
New York 17, N.Y., 405 Lexington Ave.
San Francisco 3, Cal., 1707 Central Tower Bldg.
Washington 6, D.C., 1025 Connecticut Ave., N.W.

Stran-Steel Corporation, Detroit 29, Michigan
☐ Please send me the Industrial Buildings Catalog.
☐ Please have your representative call.
Name_____ Title_____
Company_____
Address_____
City_____ Zone____ State_____
57-SS-25A 24

SALES

DATA DIGEST

• **Glycols:** 16-p. brochure describes use of diethylene and triethylene glycols in textile, tobacco, resin, plasticizer, printing ink, wood stain and other processing. Applications are also suggested in gas dehydration, air sanitation, and heat transfer mediums. Specifications, physical properties, and toxicological data are included. Carbide and Carbon Chemicals Co. (New York).

• **Colorant:** 8-p. booklet gives specifications and suggested applications for six types of Anattene, a vegetable coloring in the yellow-to-orange range. Cosmetic, pharmaceutical and food industry uses are described. S. B. Penick & Co. (New York).

• **Dispersions:** New edition of bulletin lists data for 44 colloidal and semi-colloidal dispersions of graphite, molybdenum disulfide, mica, vermiculite, zinc oxide, acetylene black, copper and glass (in isopropanol). Acheson Colloids Co. (Port Huron, Mich.).

• **Orlon dyeing:** Bulletin, OR-75, clarifies confusion about dye requirements and dyeing costs for an improved version of Orlon acrylic fiber and staple tow. Du Pont (Wilmington).

• **Plastics handbook:** Revised 224-p. edition of "Technical Data on Plastics" ($3.25) lists graphical and tabular data on fabrication, durability, electrical, mechanical and other properties of 25 types of plastic materials. Manufacturing Chemists' Assn. (Washington, D.C.).

• **Amyl alcohol:** 4-p. bulletin offers data on physical and toxicological properties, outlines uses in pesticides, plasticizers, lacquer solvents, and ore collection. Carbide and Carbon Chemicals Co. (New York).

• **Waxes:** 20-p. brochure describes company's line of anti-sun-checking waxes. Testing procedures, evaluation of wax in rubber compounds, and applications are considered. Witco Chemical Co. (New York).

• **Industry facts:** Third edition of "Chemical Industry Facts Book" is now available. Contains updated information on production, nuclear energy, and many other topics. $1.25, from Manufacturing Chemists' Assn. (Washington, D.C.).

• **Ammonium thiocyanate:** Brochure gives data on use as corrosion inhibitor in ammoniating liquors. J. T. Baker Chemical (Phillipsburg, N.J.).



Now "Dutch Boy" gellant research is helping improve latex paints

Today, latex paints are booming.

Interior types are moving fast. Exterior types are being developed now to repeat this success.

A product of "Dutch Boy" gellant research . . ."Dutch Boy" BEN-A-GEL® . . . is making unique contributions to *both*.

In inside latex paints, "Dutch Boy" BEN-A-GEL steps up color, hiding power, durability, easy stain removal and prevents water spotting.

In outside latex paints, "Dutch Boy" BEN-A-GEL does as much. And *more*. It also provides excellent weathering properties and high film integrity.

Together with BEN-A-GEL, the BENTONE®S—also products of "Dutch Boy" gellant research—are aiding new developments in cosmetics, insecticides, heavy-duty lubricants, inks, many related products. Even ceramics.

And "Dutch Boy" produces many stabilizers that do the same in vinyl plastic products.

For more information on the "Dutch Boy" Chemicals mentioned, mail the coupon below. For technical assistance in their application, write.

NATIONAL LEAD COMPANY KC-8497
111 Broadway, New York 6, N. Y.
In Canada: **Canadian Titanium Pigments Limited**
630 Dorchester Street, West, Montreal

Gentlemen: Please send literature checked below:

Folders on "Dutch Boy" Gelling Agents:
- ☐ "DUTCH BOY" BENTONES (gel organic liquids)
- ☐ "DUTCH BOY" BEN-A-GEL (gels aqueous compounds)

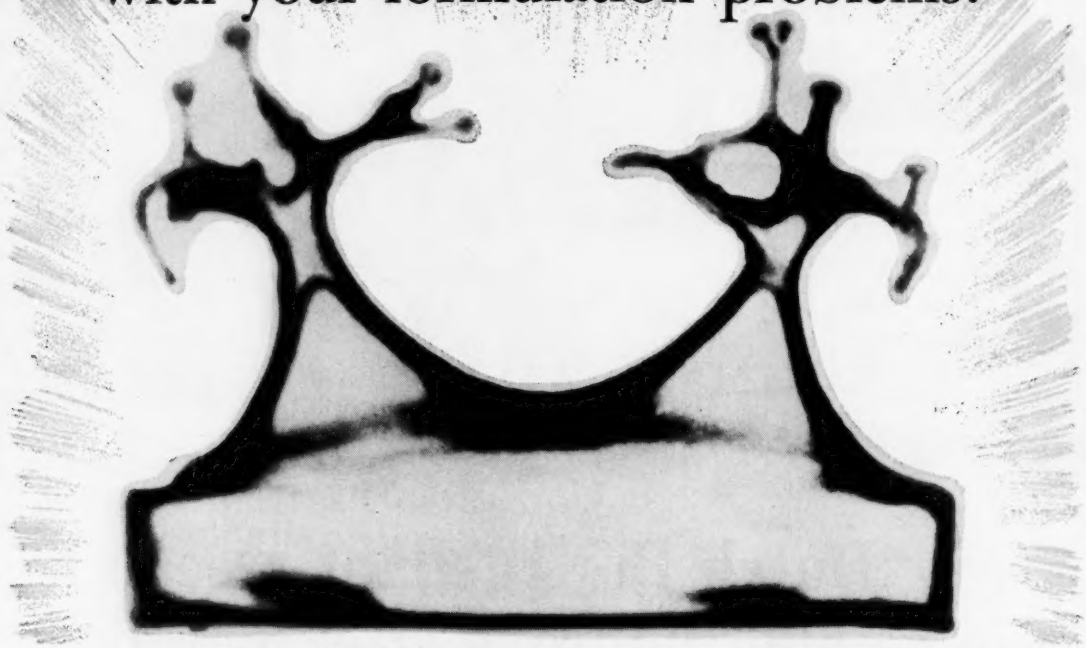
Folders on "Dutch Boy" Vinyl Stabilizers:
- ☐ (Specify type of vinyl products you make)

*Name*_____ *Title*_____
*Firm*_____
*Address*_____
*City*_____ *State*_____

Buy **Dutch Boy® CHEMICALS**

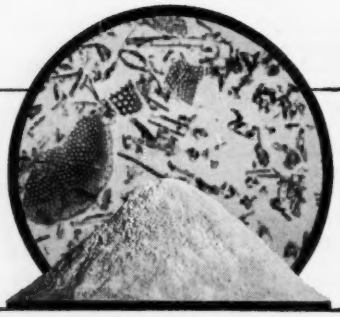
. . . and get the plus of a name you know *. . . for quality*

What's this "CROWN" got to do with your formulation problems?



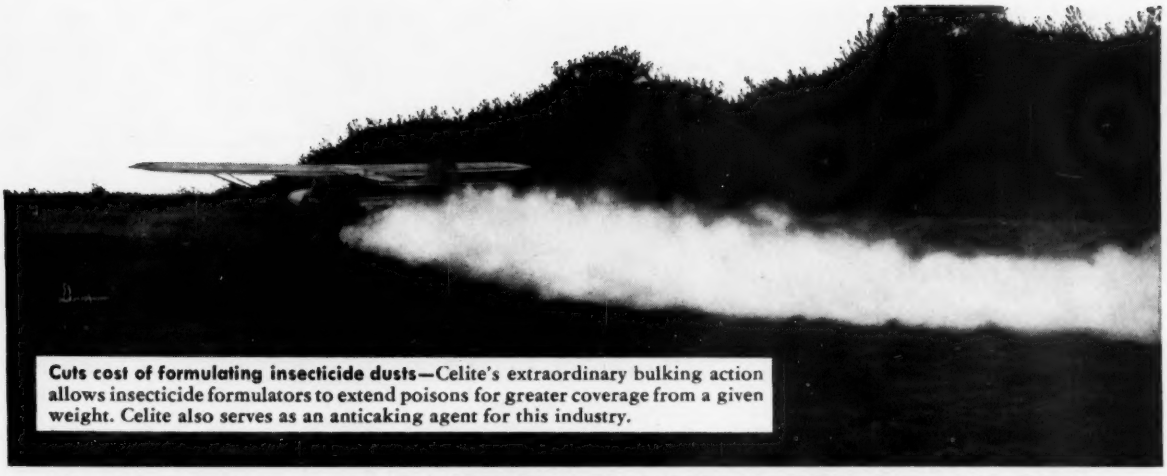
This is a particle of Celite diatomaceous earth. The genus is *Dicladia,* species is *Capreolus.* Loosely translated it means "two-sided branch." This particle is just one of hundreds of different intricate particles that together make Celite such an efficient mineral filler. When placed under a microscope *Dicladia Capreolus* becomes a rustic "crown."

It's a particle of CELITE with a cubic foot



The secret of diatomite's remarkable properties—The infinite variety of particle shapes and sizes gives Celite diatomite its exceptional performance characteristics in a wide range of process applications. Irregular shapes like the "crown" prevent packing down for high bulking action.

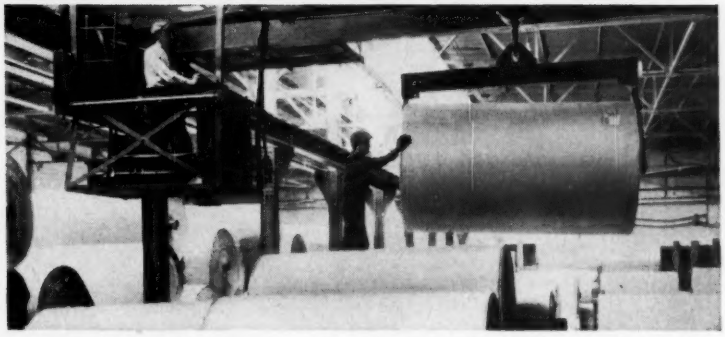
Johns-Manville CELITE



Cuts cost of formulating insecticide dusts—Celite's extraordinary bulking action allows insecticide formulators to extend poisons for greater coverage from a given weight. Celite also serves as an anticaking agent for this industry.



Controls package loss in cleansers—Cleansers and other powder products remain "fluffed up" after packaging when formulated with Celite. Celite also serves as an absorbent for detergents, wetting agents and odorants.



Adds needed bulk to paper—Because of its exceptionally low apparent density, Celite increases bulk in paper as much as 10% with a corresponding increase in machine speed. Celite is also used in paper mills to control pitch and improve brightness, opacity and ink receptivity.

—the inert mineral filler of bulk in every ten pounds

AS MUCH AS 10 TIMES greater bulking action than any other mineral filler. That's what you get when you formulate with Celite*. Composed of microscopic irregularly shaped particles of diatomite that won't pack down, Celite contains as much as 93% air space or voids in a given volume. And with its low cost per unit volume, Celite gives you far more bulk per dollar than other mineral fillers.

Many important filler applications are derived from Celite's unique properties. Its light porous mass provides great absorptive capacity, permitting preparation of high concentrate insecticides and other liquids in a dry, free-flowing powder form. The vari-shaped microscopic particles have large surface areas which serve to extend pigments in paint and papermaking. Other important uses include molded plastics, matches, concrete, acetylene tank fillers and adhesives.

Produced from the world's purest commercially available diatomite deposit, Celite comes in a wide range of grades. Each grade is carefully controlled for complete uniformity.

Ask your local J-M Celite engineer to tell you how Celite can help solve your formulation problems. He's backed by Johns-Manville's extensive research facilities and years of practical diatomite experience. Call him today or write Johns-Manville, Box 14, New York 16, N. Y. In Canada, write Port Credit, Ontario.

*Celite is Johns-Manville's registered trade mark for its diatomaceous silica products.

Industry's most versatile MINERAL FILLERS

JOHNS-MANVILLE JM PRODUCTS

Noncellulosic capacity is soaring:

Next year, capacity should be bigger by 230 million lbs.

Groups	Estimated '57 Capacity (million pounds)	Estimated Additional Capacity in '58 (million pounds)
Acrylic	120.0	96
Dinitrile	—	30
Polyamide (nylon)	350.0	96
Polyester	50.0	10
Polyethylene	5.0	—
Polyvinyl acetate	0.8	—
Protein	6.0	—
Vinylchloride-polyvinylidene chloride copolymer (saran)	30.0	—
Polystyrene	0.3	—
Tetrafluoroethylene	0.1	—
Total	560-565	230-235

Pacing the Fiber Climb

Spearheading the synthetic fiber push are the non-cellulosics, now climbing, as a group, toward an 800-million-lbs./year capacity.

MAN-MADE noncellulosic fibers are solidly in the "big time": production this year is expected to hit close to 450 million lbs.—up substantially from last year's 400 million, and more than 70 million lbs. higher than it was in '55. But that isn't all. More capacity is being built and, by the end of this year, U.S. noncellulosic fiber capability may nudge 565 million lbs.

The continuing noncellulosic climb is even more striking in light of the total synthetic-fiber production drop in '56 to 1.6 billion lbs. from the previous year's 1.7 billion.

Today, there are nine chemically different noncellulosic fiber groups (*see tables above and on p. 130*) commercially available. Another will hit the market next year when B. F. Goodrich's Darlan dinitrile fiber is introduced.

Nylon Trail-blazer: First of the true man-made fibers, of course, was nylon, which today makes up the bulk of noncellulosic output. Capacity this year will crowd the 350-million-lbs. level, with production lagging not too far behind. And in the works are plans for nylon expansions.

Chemstrand will up capacity at its Pensacola, Fla., plant to about 114 million lbs. in '58; Du Pont will begin constructing a new nylon filament plant at Richmond, Va. Slated capacity of the latter: 40 million lbs./year.

Nylon manufacturers are certain that their fiber has a long way to go before reaching a consumption peak, but some industry analysts predict that the market for the material is nearing saturation.

Bolstering the growth expectation is the encroachment nylon has made—and is making (chiefly at rayon's expense)—in the tire-cord field. Consumption of nylon for tire use has increased eightfold since '52, now totals something over 64 million lbs./year. But this is only about 16% of the combined rayon and nylon tire-cord market—a mere slice of the business nylon makers are aiming to carve.

Du Pont, for instance, with an eye on the lush market in "original equipment" passenger tires—those put on new cars—is hoping that lower nylon-cord tire prices will jack up consumption of the fiber. Du Pont points out that rubber companies are now selling nylon-cord tires at a premium of only 5% over rayon-cord tires, considerably less than in the past.

Textile for Acrylics: Few fibers have been as vigorously promoted as have the acrylics, not only among textile fabricators but also directly to the consumer. Carbide's dynel, Du Pont's Orlon and Chemstrand's Acrilan have become household words. Similar recognition—and a cut of the market—is behind newer producers' introduction of acrylic fibers with somewhat different modifications.

This year, with start-up of an estimated 12-15-million-lbs./year plant at Kingsport, Tenn., Tennessee Eastman's Verel becomes a commercial reality. American Cyanamid's Creslan and Dow's Zefran will hit commercial-scale production in '58. Cyanamid is building a 27-million-lbs./year plant at Pensacola, Fla.; Dow, an estimated 14-million-lbs./year installation at Lee Hall, Va. The newcomers will, by the end of next year, push total acrylic fiber capacity to 210 million lbs./year.

On the strength of their well-publicized wool-like characteristics, the acrylics have cut into some outlets in which wool previously predominated.



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Checklist for synthetic fibers . . .

√	**Acrylic**	
	American Cyanamid	Creslan
	Carbide and Carbon	Dynel
	Chemstrand	Acrilan
	Dow	Zefran**
	Du Pont	Orlon
	Tennessee Eastman	Verel
√	**Dinitrile**	
	B. F. Goodrich	Darlan
√	**Polyamide (nylon)**	
	Allied Chemical	Caprolan
	American Enka	Enka, Nylenka
	Chemstrand	Chemstrand
	*Dawbarn Bros.	Dawbarn
	Du Pont	Du Pont
	*Firestone	Firestone
	Industrial Rayon	IRC
	*National Plastic	National
	North American Rayon	none
	*Poliafil	Poliafil
	*Polymers	Polymers
√	**Polyester**	
	Du Pont	Dacron
√	**Polyethylene**	
	*Bolta	Poly-Bolta
	*Dawbarn Bros.	Dawbarn
	*Firestone	Firestone
	*National Plastic	Wynene
	*Reeves Bros.	Reevon
√	**Polyvinyl acetate**	
	American-Viscose	Avisco, Vinyon
√	**Protein**	
	Virginia-Carolina	Vicara, Zycon
√	**Vinylchloride-polyvinylidene chloride copolymer (saran)**	
	*Bolta	Boltaflex
	*Dawbarn Bros.	Dawbarn
	*Firestone	Velon
	*National Plastics	National
	*Oriented Plastics	Oriented
	*Saran Yarn	none
	*Southern Lus-Trus	Lus-Trus
√	**Polystyrene**	
	*Dawbarn Bros.	Dawbarn
	*Polymers	Shalon
√	**Tetrafluoroethylene**	
	Du Pont	Teflon

*Not a primary resin producer.
**Dow describes its fiber as a "nitrile alloy."

The wool industry is fighting the strong competition with stepped-up promotion and the introduction of wool blends for specific uses.

Compounding the competitive situation, too, is the rough market scramble among the acrylic fibers. Orlon, for example, has come out on top in the sweater field. Currently, an estimated 70% of the Orlon produced is consumed in this growing category.

Orlon has also successfully invaded the home-furnishing textile field and many industrial textile markets. How successful it has been can be gleaned from the fiber's sales figures. As recently as '52, Du Pont sold some 9 million lbs.; last year, the tally was close to 61 million.

Underscoring the company's expectation that Orlon will continue to blossom are its capacity expansion plans. Under construction, at Waynesboro, Va., is a new 40-million-lbs./year plant that will boost Du Pont's total capacity to 100 million lbs./year.

Acrilan, which had some tough marketing problems a few years ago (*CW, Aug. 8, '53, p. 67*), has come back strongly; its biggest present outlet is in knitted jersey wear, and the fiber is now beginning to invade two other markets—blankets and outdoor wearing apparel.

Chemstrand's current Acrilan capacity (at Decatur, Ala.) is estimated at some 36 million lbs./year, and, according to company officials, as of earlier this year (*CW Market Newsletter, Feb. 23*), actual production was slated to press almost to that limit. Further underscoring the fiber's comeback is word that Chemstrand plans to expand capacity about 50%—to about 54 million lbs./year.

Dynel, Carbide's acrylic entry, (and smallest among the acrylics in terms of capacity in-place—an 8-million-lbs./year plant at South Charleston, W. Va.), not so long ago challenged fur's supremacy in ladies' coats. The fiber's "fur-like pile" coats have become quite popular, chiefly because of the less expensive price tag; but more recently, dynel has dug into a probably more-lucrative floor-covering market.

Dynel rugs, touted as being resistant to soilage, mildew, burning and chemical staining, are meeting with such enthusiastic consumer acceptance that one carpet industry spokesman envisions the fiber as "becoming one of



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the leading contenders among the synthetics for this market."

On the other hand, Du Pont's Dacron polyester fiber may well earn the title "most ubiquitous," and according to some market observers, surge ahead with an individual consumption level vying with today's total acrylic production. Why? Its use in apparel, home furnishings, and industrial applications has grown far greater than early expectations.

Du Pont's Dacron capacity has been reported as being about 35 million lbs./year, but chances are that a higher figure—perhaps 50 million lbs.—is more accurate. Du Pont is officially mum on capacity data, but does admit that additional plant facilities under construction at Kinston, N.C., will increase present Dacron capacity "25% by the end of the year."

Saran Buffeting: Vinylchloride-polyvinylidene chloride copolymer fibers—the so-called "saran" group—is at present going through a rather shaky period. Reason: its biggest outlet, auto seat covers, has been hard hit by competition, such as the clear vinyls.

In other uses (e.g., outdoor furniture upholstery, awnings, appliance cords, handbags, shoes), saran fibers appear to be holding their own. But unless another large-scale use, comparable to auto seat covers, opens up, saran fiber growth may not be rapid.

Polyethylene Push: Recent development of linear polyethylenes may well jostle polyethylene fibers into greater industrial textile prominence. Prior to introduction of the low-pressure, high-tenacity material, polyethylene fibers (which feature chemical resistance, low specific gravity, shrinkage properties) found somewhat limited applications. Biggest: ropes. Lesser amounts went into novelty fabrics, and filter cloths and similar outlets where strength, softening point and elongation were not important.

The newer linear polyethylene reportedly has properties exceeding those of saran and approaching those of nylon; and these superior qualities—greater strength and tenacity, low melting point—are expected to extend older polyethylene fiber markets, open a raft of newer ones. Chances are, though, today's total polyethylene-fiber capacity (about 5 million lbs./year) will satisfy all requirements for some time to come. Optimistic marketers, however, are nursing a fond 10-million-lbs./year consumption hope, targeted for the early '60s.

On the whole, then, noncellulosic fibers—including those still in the toddling stage, productionwise—will grow in step with ultimate consumer demand. Biggest lines for the consumer will be the "extras" in man-made fibers that nature overlooked in its products.

Canadian Indicator?

If the figures for January (latest available) on Canadian shipments of chemicals and allied products to the U.S. is any harbinger, '57 may well wind up as a poor year indeed for this facet of Dominion trade. Total value of such shipments declined to about $6,694,000 from $6,770,000 in the previous month, and $8,441,000 in Jan. '56.

Canadian government officials point out, however, that chemical and related product shipments to all foreign markets in the same period bounced to a higher total of $16,074,000 from Dec. '55's $14,056,000. Such exports in the first month of this year, too, topped Jan. '56's by some $2,000,000.

Shipments to the United Kingdom rose to $1,445,000 in January from the previous month's $1,261,000, but were still slightly below the $1,511,000 worth of items shipped in Jan. '56. The tally on shipments to countries other than the U.S. and U.K.: $7,934,000 in January of this year; $6,025,000, Dec. '56; only $4,744,000 during Jan. '56.

Shipments Comparisons: Here's a comparison breakdown of some important shipments to all markets during Jan. '57 and Jan. '56:

Product	Jan. '57	Jan. '56
Acids	$501,000	$267,000
Drugs, pharmaceuticals	611,000	416,000
Fertilizers	3,813,000	4,548,000
Paints, varnishes	127,000	176,000
Calcium compounds	118,000	80,000
Soda, sodium compounds	328,000	563,000
Cobalt oxides, salts	119,000	—
Plastics	2,390,000	1,111,000
Polystyrene	7,183,000	6,981,000
Other chemical products	7,183,000	6,981,000

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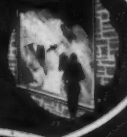
Blended with polyester resins, Uvinul stabilizers prevent discoloration and deterioration in sunlight.



Uvinul absorbers incorporated into sunglasses or safety glass filter out UV radiation, which is harmful to the eyes.



Uvinul absorbers added to coatings or finishes for natural or synthetic fibers, leather, paper, and similar materials protect the substrate.



Colorless transparent cellulose acetate sheets containing Uvinul absorbers protect display merchandise, photographic prints and UV-sensitive chemicals.



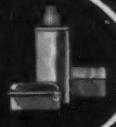
Uvinul stabilizers increase the shelf-life of cosmetic liquids, creams and pastes containing perfumes and dyes.



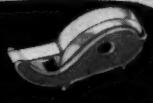
Uvinul absorbers blended into polymethylmethacrylate sheets stabilize the resin and protect interiors when this material is used for glazing.



Uvinul absorbers added to lacquers retard color change in many natural and chemically-treated furniture woods.



Uvinul absorbers may be formulated into waxes, polishes, oils, creams, and aerosols to increase the effectiveness of these protective coatings.



Uvinul stabilizers added to pressure-sensitive adhesives increase the life of the bond as well as of the backing strip.

THESE ARE BUT A FEW OF THE MANY USES OF THE UVINUL ABSORBERS. MORE DETAILED INFORMATION IS AVAILABLE UPON REQUEST.

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Prepared by U. S. Industrial Chemicals Co.

U.S.I. CHEMICAL NEWS

April 20 ★ A Series for Chemists and Executives of the Solvents and Chemical Consuming Industries ★ 1957

Cabot Plans Silicon Dioxide Unit to Integrate With U.S.I.'s Tuscola Plants

Cabot Carbon Company, a subsidiary of Godfrey L. Cabot, Inc., Boston, Mass., has announced plans to build a silicon dioxide plant at Tuscola, Illinois. It will be located near U.S.I.'s ammonia plant and the ethyl chloride facility of National Petro-Chemicals Corporation (subsidiary of U.S.I.), and it will take advantage of raw materials supplied by these plants.

Raw materials used in the production of Cabot's finely divided silicon dioxide Cab-O-Sil* are silicon carbide, chlorine and hydrogen. The process used is a vapor-phase hydrolysis of silicon tetrachloride in a hot gaseous environment. This process utilizes hydrogen given off at Petro's ethylene cracker and purified in U.S.I.'s ammonia plant. In addition, Cabot will get steam and water from Petro.

MORE

Water-Alcohol Injection To Turbo-Jet Engine Cuts Aircraft Take-Off Distance

The water-alcohol injection technique, now used in the J47 gas turbine engines which power the B-47 bombers, has good possibilities in commercial jet aircraft design. It is reported to cut ground run distance and to be the most satisfactory way to increase overloaded safety on short fields. And it may be the answer to high-altitude field take-offs of commercial transports on hot days.

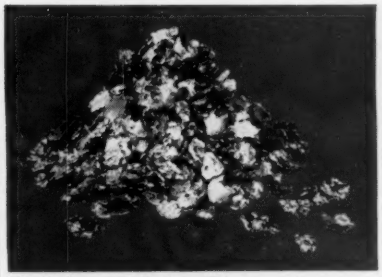
When injected into the combustion chamber of a turbo-jet engine, water is vaporized to steam which expands and increases the thrust. 28% alcohol is added to burn and so neutralize the cooling effect of the water. The B-47 bombers operate on 650 pounds per second of the water-alcohol mixture. They get about 22% increase in thrust, and 2,000 feet are cut from their ground run distance.

Chemical Buyers Get Tips On Raising Company Profits

Suggestions on how to increase company profits by making full use of vendor services were heard by the Chemical and Allied Buyers Group of the National Association of Purchasing Agents at their annual midwinter conferences held in New York and Chicago during January of this year.

In panel discussions, many specific vendor services were mentioned as being money savers for the chemical buyer's company. Among them: research and statistical data procurement, package development, raw material analysis, preparing detailed shop drawings from general specifications and sketches, special inventory stocking, consolidation of shipments and billings, specially tailored materials handling units, and employee training programs.

Keynoter for these panels emphasized use of a vendor's technical personnel and research facilities in solving mutual problems.



U.S.I. to Make Zirconium as Non-Pyrophoric Platelets

Production Plan Expanded To 2,000,000 Lbs. a Year

Reactor and commercial-grade zirconium, in the unique form of non-pyrophoric, non-hygroscopic platelets rather than sponge, will be supplied to government and industry from the U.S.I. zirconium plant at Ashtabula, Ohio, scheduled to come onstream in the second quarter of this year.

Platelets—irregular flake-like pieces about the size of dimes and quarters—insure greater safety during handling and shipping. Since they are classified as metal rather than as metal sponge, they are subject to none of the restrictions applied when the sponge form is handled. For safety reasons, the Interstate Commerce Commission requires that sponge be shipped in metal drums containing not more than 75 pounds, and that the sponge be contained in polyethylene bags and blanketed by argon gas. None of these restrictions apply to platelets.

Zirconium platelets can be compacted for melting as easily as sponge and with virtually no waste. They are of extremely high purity, being almost completely free of sodium, magnesium, chlorides, hydrogen and moisture. Freedom from impurities provides for a much cleaner melting operation for the user.

MORE

Polyethylene Resins Are Now Being Foamed

Polyethylene can now be obtained from processors as an expanded, closed-cell, flexible foam in extruded and molded forms. The cells are small and uniform and contain a harmless, inert gas.

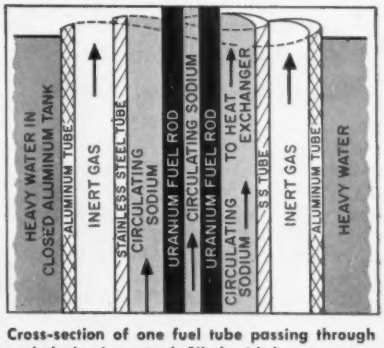
Indications are that the foamed material retains all the basic, desirable properties of polyethylene—its flexibility, toughness, chemical resistance and moisture resistance. The foam won't flake or dust. It is being evaluated for gaskets, cap and closure linings, insulation, shock absorbers, packaging, buoys and life floats, and for radiation shielding.

Foam density can be varied from 10 to 50 pounds per cubic foot. As density goes up, tensile strength and load recovery increase and deformation decreases. To date polyethylene foam has been fabricated with common wood and metal working tools, and has been drilled, machined, sawed, hot gas welded and friction and heat sealed.

First Sodium-Deuterium Reactor Authorized by AEC

Long considered almost ideal by nuclear experts, a sodium-deuterium power reactor has been authorized by the AEC. It is planned for construction at Anchorage, Alaska in 1962, and is being developed by Nuclear Development Corporation of America. The proposed reactor will use heavy water as moderator, liquid sodium as coolant and slightly enriched uranium as fuel.

The reactor will consist of an aluminum tank filled with heavy water, tightly sealed except for a closed-cycle fuel system passing through the tank. The fuel system consists in part of a number of fuel tubes, each tube being made up of two concentric pipes. Sodium flows through the inner pipe past uranium fuel rods, picking up the heat created by the fuel rods and transferring it to a heat exchange system. An inert gas under pressure flows through the outer pipe. This gas serves to insulate the inner pipe and will be at a pressure higher than that of the water or sodium, minimizing the possibility of contact should a leak develop.



Cross-section of one fuel tube passing through sealed aluminum tank filled with heavy water. Tube consists of two concentric pipes. Inner pipe contains uranium and sodium. Outer pipe contains inert gas.

Advantages claimed for this system include: operation on low-enriched fuel; long fuel lifetime; more complete burnup of U-235 and the plutonium produced; delivery of heat at very high temperatures without high pressures; low pressure for entire reactor system, eliminating need for expensive pressure vessel; absorption by moderator of fewer neutrons than light water or graphite; suitability over wide range of power levels without radical design changes.

Argon Grade Sodium Frequently Used

Liquid sodium is used as a coolant in two other types of nuclear energy systems — the sodium-graphite and fast-breeder reactors. One fast-breeder now under construction will use U.S.I.'s Argon Grade Sodium as coolant material.

This grade of the metal is carefully filtered free of oxide to avoid corrosion in lines and other parts of the heat transfer system. It is processed and packed under a blanket of inert argon gas to maintain the oxide-free condition.

April 20 ★ **U.S.I. CHEMICAL NEWS** ★ 1957

CONTINUED *Zirconium*

Production Goal Expanded

Originally scheduled to produce 1,500,000 pounds a year, the plant is now slated to turn out 2,000,000 pounds annually. Under a contract signed on May 1, 1956, 83,000 pounds a month are committed to the Atomic Energy Commission. An equal amount will be offered to industrial users.

U.S.I. is now quoting prices of $4.75 to $6.50 per pound, depending on quantity, for its hafnium-free zirconium platelets as compared with the present price of $12.00 per pound for sponge. This is due to U.S.I.'s economical sodium process—the first semi-continuous process for making zirconium—which requires a lower initial investment than the conventional magnesium process.

Commercial zirconium which is not hafnium-free and which is suitable for non-nuclear uses will sell for about a dollar and a half less per pound.

Industry Will Get Hafnium

The forthcoming plant will also have 20,000 pounds of hafnium as hafnium oxide or sponge available for industrial use. Hafnium, an excellent neutron absorber, is employed in atomic reactors as a control rod material.

Amino Acid Deficiencies Cause Damage to Nervous System and Vital Organs

According to recent laboratory studies on experimental animals, serious disturbances in the higher nervous system, as evidenced by lower reflex action, can be caused by deficiencies in lysine and methionine. Degeneration of the liver, pancreas and kidneys may also result.

Five weeks on a balanced diet restored the activity of the organs affected, but part of the reflex damage appeared to be permanent.

CONTINUED *Silicon Dioxide*

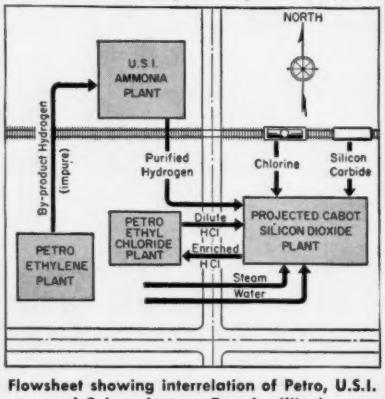
Petro Uses By-Product HCl

By-product hydrochloric acid from Cabot's new plant will be used in National Petro-Chemicals' ethyl chloride plant. A stream of hydrochloric acid will circulate between Petro's ethyl chloride facility and Cabot. By-product hydrogen chloride from Cabot's new plant will enrich the circulating stream, and will be removed at Petro for use as a raw material in the ethyl chloride unit. Hydrogen chloride for this unit is currently being made by burning hydrogen with chlorine.

Unit Produces "White Carbon Black"

Cab-O-Sil silicon dioxide—a white pigment frequently called "white carbon black"—is now produced for Cabot in Germany, but increasing demand has made an American plant necessary. The new unit will have an initial capacity of about 100 carloads per year. The product is claimed to surpass the precipitated type synthetic silicas for reinforcing plastics and rubbers, as a suspending agent in paints, a flatting agent in varnish, a gelling agent in lubricants, an anti-slip agent in wax and in the insulation of electrical equipment and many other fields.

*®by Godfrey L. Cabot, Inc.



Flowsheet showing interrelation of Petro, U.S.I. and Cabot plants at Tuscola, Illinois.

TECHNICAL DEVELOPMENTS

Information about manufacturers of these items may be obtained by writing the Editor, U.S.I. Chemical News.

Formulation for a witch hazel foam shave cream is now being offered by manufacturer. Witch hazel distillate is claimed to lend refreshing cleansing and soothing qualities to this new aerosol foam shave cream formulation. **(No. 1220)**

Four new antistatic agents for polyethylene are reported to destaticize permanently. A half to one per cent is incorporated into polyethylene pellets or powder before extrusion or molding. Used on high and low pressure resins. **(No. 1221)**

Portable paper laminator which can be used to preserve documents is described in a recent pamphlet accompanied by a price sheet which is itself covered with the preserving film. **(No. 1222)**

To fireproof fabrics right in the home, a powdered anti-flame agent has been developed which is non-toxic and does not harm the appearance, hand or comfort of the fabric. Used as a rinse after the regular wash, it must be reapplied after each laundering. **(No. 1223)**

New marking ink for plastics and other hard surfaces uses pigments to get highly opaque colors. Is claimed non-corrosive, non-etching, fast-drying and with excellent adhesion. Wears well and resists water, many solvents. **(No. 1224)**

The flavoring of pharmaceuticals is discussed in a new catalog which gives for the first time a truly comprehensive list of materials developed for or adapted to this purpose. Guide is carefully indexed and cross-referenced. **(No. 1225)**

Induction furnaces for analyzing hydrogen in titanium and zirconium can now be obtained, reported to handle samples up to 10 grams in solid, drilling or chip form. Sample is burned in oxygen and resulting water is weighed. **(No. 1226)**

Sterile polyethylene bags are used to pack petri dishes containing ready-to-streak culture media. Now available in this pack are nine different culture media used in routine bacteriology and mycology. **(No. 1227)**

New unit for operating laboratory water baths combines in one piece of apparatus a self-contained heater, controller, stirrer and circulator with a built-in pneumatic control system claimed sensitive within ±0.05°C. **(No. 1228)**

New dry film lubricant for drawing and forming titanium and its alloys, chromium and stainless steels at 600-1400°F has been formulated. Consists of fine graphite plus high-temperature binder dispersed in aromatic solvents. **(No. 1229)**

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Phosphoric Acid
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Nitrogen Fertilizer Solutions
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Alcohols: Ethyl (pure and all denatured formulas), Normal Butyl, Amyl, Fusel Oil; Proprietary Denatured Alcohol Solvents SOLOX®, FILMEX®, ANSOL® M, ANSOL® PR.

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Pharmaceutical Products: DL-Methionine, N-Acetyl-DL-Methionine, Riboflavin USP, Urethan USP, Intermediates.
Metals: Titanium Sponge, Zirconium Sponge, Zirconium Platelets, Hafnium Oxide, Hafnium Sponge.

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Market Newsletter

CHEMICAL WEEK
April 20, 1957

Sulfuric acid sellers are more cheerful than they have been now that the anticipated seasonal demand pickup from fertilizer manufacturers is materializing. Most sulfuric suppliers report that in most areas the acid is moving at "a comfortable pace," especially for production of ammonium sulfate and superphosphates.

There are, however, a couple of dark streaks in the otherwise brighter sulfuric outlook: this current better demand for fertilizer materials is being discounted by some producers and dealers with a pessimistic "It won't last"; steel production, a major sulfuric consumer, is running at less than full capacity. Sheet output, for example, was recently cut back.

What about acid prices? Despite additional sulfuric capacity coming in (*CW, March 30, p. 64*) and lessened demand from some consuming outlets, chances are that producers will hold the price line.

•

The insecticide industry is also getting a welcome hypo from the stepped-up agricultural activity. Heavy stock carryovers have been a problem. (Formulators' stocks of DDT were 46% higher and producers' stocks, 78% higher in '56 than in '55).

But recent heavy snows and rainfall may prove effective whittlers. "Bugs," says one insecticide seller, "should be buzzing like crazy this summer."

•

There's a question being buzzed around the paint trade this week: Why was there a drop in some lead pigment prices? Litharge and red lead are down ¾¢ and ¼¢/lb., respectively, and the cuts are not related to any corresponding change in pig lead tags, the usual reason for changes in pigment prices.

Only other time in the last four or five years that a similar situation developed occurred last May when producers upped pigment prices ½¢/lb. and attributed the increase to higher production costs.

•

There's no doubt, though, that reserpine prices have tumbled, and probably down to rock bottom. Major makers of the material are generally quoting a $2.40/gram price and are reportedly reluctant to shade prices any further.

How badly the tranquilizer's price has been battered is clearly evident. When first made commercially available back in about '53, it sold, in crystalline form, at $30/gram; two drastic price cuts in late '55 brought the price down to about $8.50/gram. Thus, today's $2.40 figure puts reserpine at its lowest level.

According to some trade followers the low price may well contribute "a greater degree of stability to the market."

"Recent technological advances in production and improved product distribution" are advanced as reasons behind Goodyear Tire & Rubber's 5½% price reduction on its heavy-duty vinyl chloride film packaging material, Vitafilm. The drop: from 84¢/lb. to 79¢/lb., all-in-all, a cut of more than 25% since the material's introduction as a textile wrap in '53 (*see also p. 113*).

And there's word of expansion, too. J. S. Bruskin, general manager of the firm's Film & Flooring Division, discloses that when work on additional Vitafilm production facilities (at Goodyear's Akron Plant B) is completed next month, it'll jack up current capacity by almost 150%.

•

More ethanolamines are hitting the market, too. Carbide, rated as the country's largest producer, revealed late last week that the new ethanolamines unit at its Seadrift, Tex., plant is in production.

The company is mum as to precisely how much of the intermediate it can produce, says merely that the addition doubles capacity. But earlier estimates (*CW, Nov. 24, '56, p. 86*) peg Carbide's total ethanolamines capacity (now that the new unit is operating) from Seadrift and South Charleston, W. Va., plants at about 90 million lbs./year. The addition probably raises total U. S. capacity to a 170-million-lbs./year rate.

•

Exact lithium consumption figures are hard to come by, since nuclear energy and other defense uses are classified, but markets men were given a fairly good estimate of '56 nondefense use last week. The estimate came from American Potash's David Stern at a meeting of the Southern California Market Research Assn.

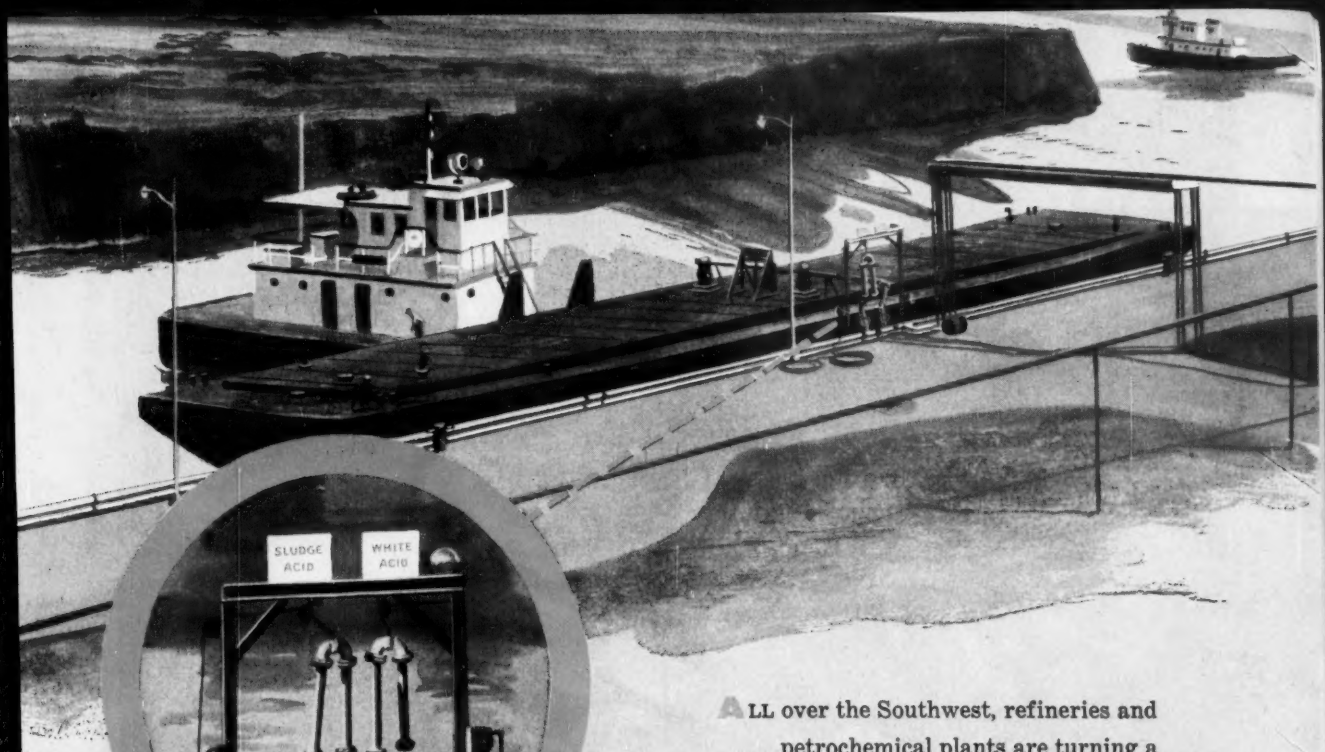
Stern's end-use breakdown: lubricants, 35%; ceramics and glass, 27.8%; metallurgical and organics, 14.7%; storage batteries and miscellaneous, 10.2%; air conditioners, 7.3%; welding and brazing, 5%.

Nondefense demand for lithium is growing steadily if unofficial "guestimates" are accurate; last year, such use hit about 11.5 million lbs., compared with some 9.6 million in '55 (*CW, April 7, '56, p. 122*).

SELECTED PRICE CHANGES — WEEK ENDING APRIL 15, 1957

	Change	New Price
UP		
Tin, Straits	$0.0025	$0.9875
Zinc cyanide, dms., 1,000-lb. lots or more, wks.	0.027	0.55
DOWN		
Dry red lead, wks., frt. alld., bbls., c. l.	0.0075	0.1825
Litharge, com., pdr., bbls., wks., frt. equald., c. l.	0.0025	0.1775

All prices per pound unless quantity is stated.



PROFIT FROM WASTE

with Consolidated's sludge acid regeneration service

ALL over the Southwest, refineries and petrochemical plants are turning a disposal problem into an asset by shipping their spent acids to one of Consolidated Chemical Industries' five sulphuric acid recovery plants. Here even the heaviest sludges, with the lowest per cent of free acid, are turned into fresh, white 99% product on a contract basis. Shipments are handled by road, rail or water.

This acid regeneration service is in keeping with Consolidated's leadership in the manufacture of sulphuric acid and allied chemical raw materials. Whether your requirements are for a fast, dependable source of new acid or for a method of turning past waste into future profit, you can depend on CCI—the *big* name in sulphuric acid in the Gulf Southwest. Write for complete information.

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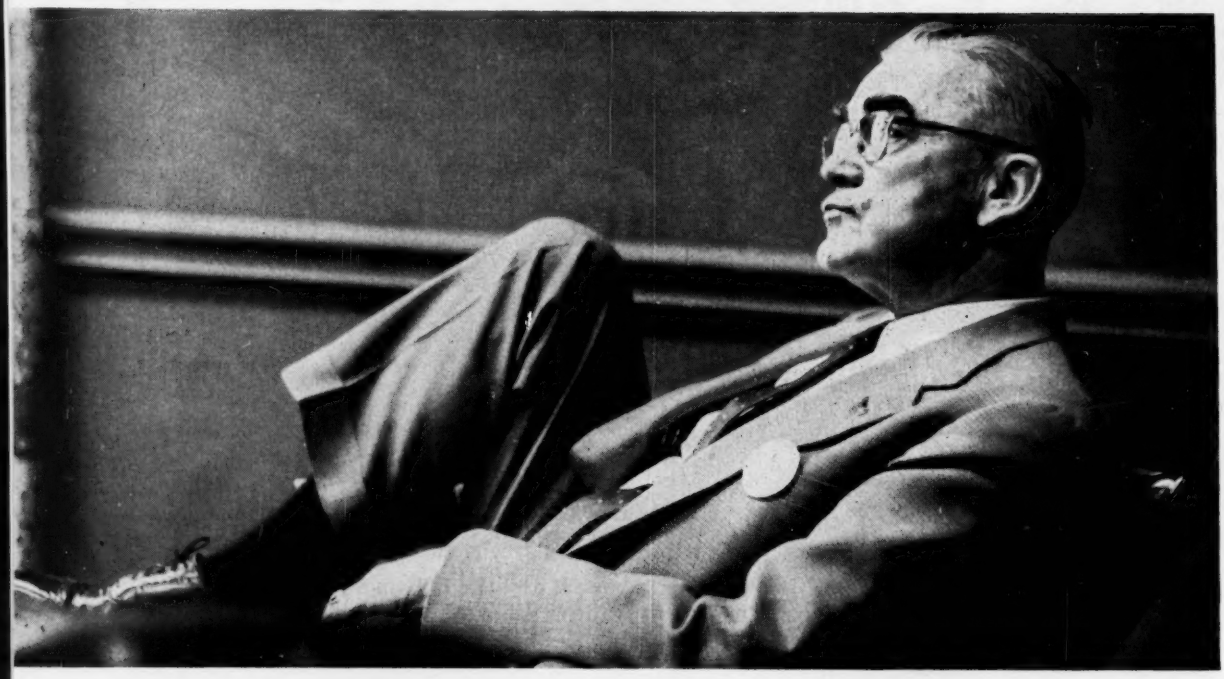
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UOP'S RAAEN: 'We pay in the top 10% of the ACS curves. There's no limit on a Ph.D.'s pay, if he produces.' At Universal Oil Products, salary is just one element in a plan designed to . . .

Get the Most from Research Manpower

Turning a profit in the highly competitive field of petroleum research isn't easy for a smaller company. But Universal Oil Products Co. (Des Plaines, Ill.) — a medium-size independent—has mastered the art. Some of the secrets behind its research success were recently aired in an address before the American Management Assn. in Chicago. The spokesman: Col. John Raaen, vice-president in charge of the firm's research and development laboratories.

Raaen attributes UOP's standing chiefly to its emphasis on effective utilization of its scientific manpower —a policy that has cut turnover to about 0.1%/year (vs. a national average of 3-5%/year), upped its staff's patent productivity 50% in the last two years.

He gives two reasons for the policy: "Research results are our only products. We'll go out of business when results stop coming out of our labs. Further, we are in direct competition with some of the largest corporations in the U.S, They, like us, want to hire and keep top-notch scientists and engineers. We don't care if our competitors are bigger than we. We do care if they outdo us."

Raaen concedes that not all of the techniques UOP uses to maximize researchers' efficiency may be useful to other firms. However, he believes these three points—surroundings, administration and information—are important in any program to increase research productivity.

Surroundings include the physical area, "the brick, steel and glass shell within which scientific manpower works" as well as the tools with which it works. He limits administration to control and direction of the research and development departments; the information aspect concerns itself with "facts management needs to make decisions, facts it must provide to help improve work output and ways to transmit the data."

The Right Setting: Raaen thinks well-designed buildings and proper equipment pay dividends in productivity. He reveals that since UOP's new research laboratories in Des Plaines were occupied in 1954, patent disclosures recorded by the firm's personnel have increased 50%. UOP, incidentally, is among the top three companies in terms of total petroleum process patents granted annually. A major UOP milestone was the development of the first successful platinum catalyst for naphtha reforming—upgrading low-octane naphthas—a process important in high-octane gasoline production.

UOP'S new laboratories reflect the new trend in lab building (*CW, Feb. 12, '55, p. 40*), since laboratory and

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TECHNICAL BULLETINS

( ) I-17 NACCONATES . . . General Product Information
( ) I-17A NACCONATE 80 (Tolylene Diisocyanate Isomeric Mixture)
( ) I-17B NACCONATE 65 (Tolylene Diisocyanate Isomeric Mixture)
( ) I-17C NACCONATE 100 (2,4 Tolylene Diisocyanate)
( ) I-17D NACCONATE 200 (3,3'-Bitolylene 4,4'-Diisocyanate) (TODI)
( ) I-17E NACCONATE 300 (Diphenylmethane 4,4'-Diisocyanate) (MDI)
( ) I-17F NACCONATE 310 (3,3'-Dimethyldiphenylmethane 4,4'-Diisocyanate) (DMMDI)

APPLICATION DATA SHEETS

( ) 41156—Flexible Foams
( ) 7956—Semi-rigid Foams
( ) 112356—Protective Coatings

E-10

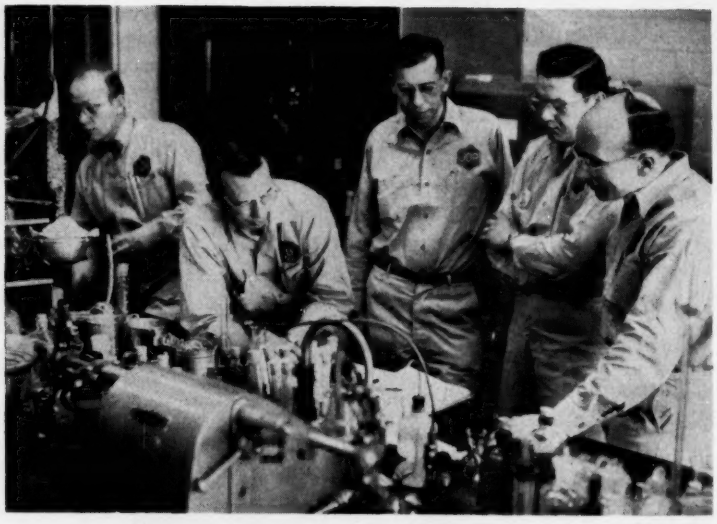


EVIDENCE OF PAYOFF: Patent productivity has increased 50% in last two years.



'THOROUGH two-way communication is required to make (our) research philosophy work.'

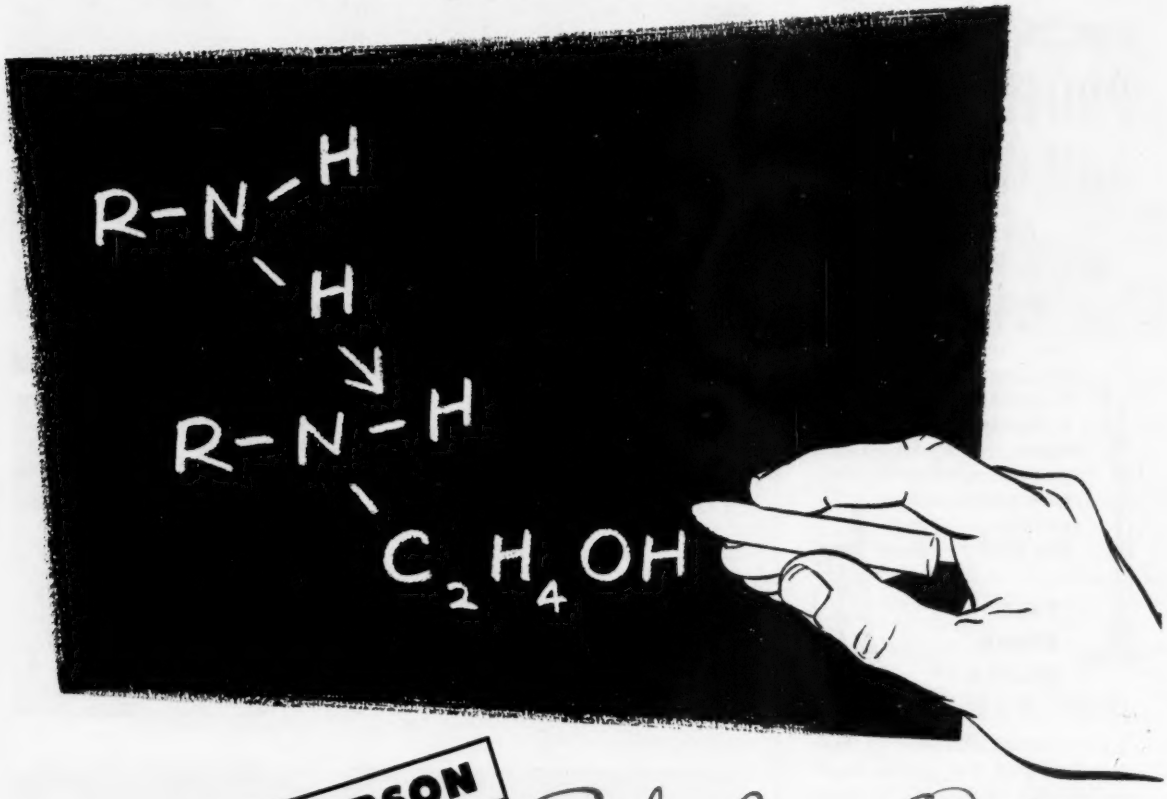
IN RESEARCH TEAMS: Effective utilization of each member's special training is stressed.



GETTING THE FACTS: Research directors meet every two weeks to discuss administrative facets.



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Ethylene Oxide combines with compounds containing labile hydrogens to give 2-hydroxyethyl derivatives.

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- *Reactions proceed under mild conditions which preclude side reactions with solvent water or alcohol.*
- *Alkylamines generally react more readily than arylamines.*
- *Reactions with ammonia and amines are apparently promoted by polar solvents, and by hydroxyethyl reaction products.*

And, for amides:

- *Hydroxyethylation of carboxylic acid amides and sulfonamides is promoted by alkaline substances.*

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Analysis of Williams Pure Black Iron Oxides B-247 & BK-250

$FeO + Fe_2O_3$	96.0% Min.
FeO	20.0% Min.
H_2O Soluble	0.5% Max.
Sp. G.	4.96
Fineness thru 325	99.5
pH Value	7-9
Avg. Diameter	0.4 microns

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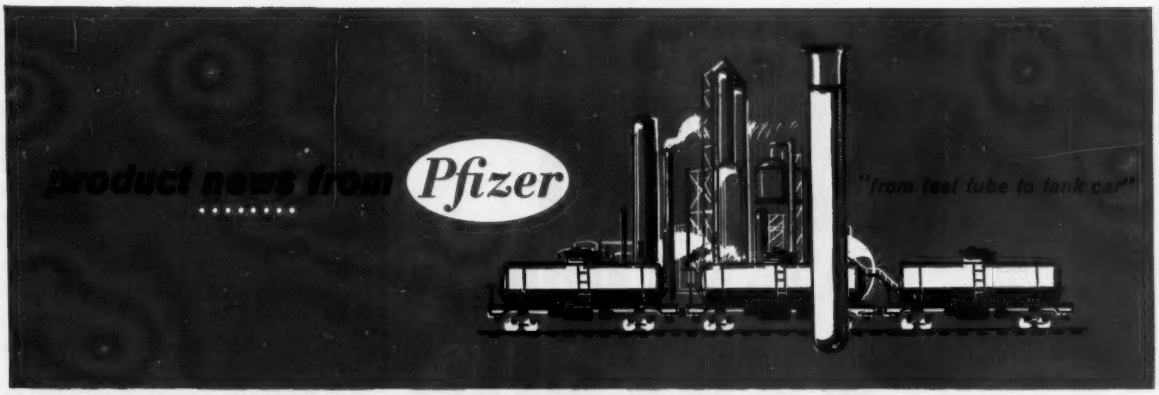


LECTURES: A monthly feature, they draw leading authorities.

office space are separated for economy (lab space is about three times as expensive as office space) and for other reasons. "We have found that the slight physical separation of a researcher's office from his laboratory also provides a change in surroundings," avers Raaen. "It helps our men shift mental gears when, after working in the lab, they sit down to do purely creative thinking connected with their work."

Administered by Three: The administrative organization at UOP is unusual, since it features three research directors—one each for chemical, refining, and physics research—Joseph Chenicek, Vladimir Haensel, and Maurice Murray, respectively. Each reports to Raaen. There are a total of 237 researchers of whom 8% are Ph.D.s, 5% have masters' degrees, 27% have B.S. degrees. The remaining 60% do not have degrees but are skilled in their jobs. Many attend evening school, are working toward degrees.

Each research department is com-



VERSATILE ORGANIC ACIDS AVAILABLE IN QUANTITY

● When Pfizer opened the world's first successful citric acid fermentation plant in 1923, the world price of citric dropped more than two-thirds! Since that time Pfizer leadership in fermentation chemistry has made many other useful acids available to industry in quantity.

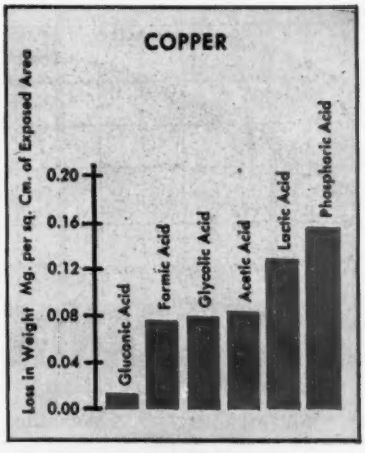
CITRIC ACID

Pfizer offers citric acid in both anhydrous and hydrous forms. With Pfizer's anhydrous form of citric acid, you save money in reduced freight costs. Why pay freight for 8½ lbs. of water per each 100 lbs. of citric shipped? In addition the anhydrous form offers the advantage of ideal quality control since there is little or no variation in moisture content.

Citric acid is a relatively strong acid notable for its nontoxicity, its sequestering ability and the number of chemical reactions it will undergo. Pfizer also offers citric acid salts and five esters in commercial quantities. These are Triethyl and Tributyl Citrates as well as their acetylated forms. Acetyl tri-2-ethylhexyl citrate is also available.

GLUCONIC ACID

By the fermentative oxidation of glucose, Pfizer produces gluconic acid, which it offers as a 50 percent aqueous solution and in the form of stable salts. Gluconic acid has a low order of toxicity, is extremely mild and non-corrosive and has excellent sequestering properties. Tests at Pfizer have shown that 1N gluconic acid solutions affected metals less than any of five other mild acids. Consider copper for example:



OXALIC ACID

Pfizer developed a fermentation process which yields oxalic acid in a high degree of purity. One of the outstanding features of this strong acid is its ability to solubilize iron oxide. Pfizer Oxalic Acid is available in granular and fine granular forms. Ammonium, ferric ammonium, ferric and other oxalates are also available.

TARTARIC ACID

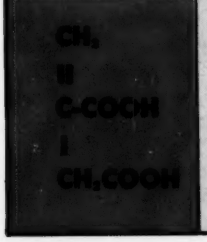
Crystalline deposits in wine fermentation vats provided the raw material from which Pfizer began producing high purity tartaric acid in 1862. Like citric and gluconic acids, tartaric acid is notable for its low toxicity and its sequestering activity.

ITACONIC ACID

Pfizer skill in fermentation has made industrial itaconic acid a reality. Two carboxyl groups, a conjugated double bond and an active methylene group make itaconic acid a reactive and versatile molecule. Itaconic esters, readily prepared in high yields, can be polymerized and may serve as useful plasticizers. Polyesters of itaconic acid and glycols may be polymerized or copolymerized to hard thermoset resins.

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PHYSICAL PROPERTIES OF ITACONIC ACID



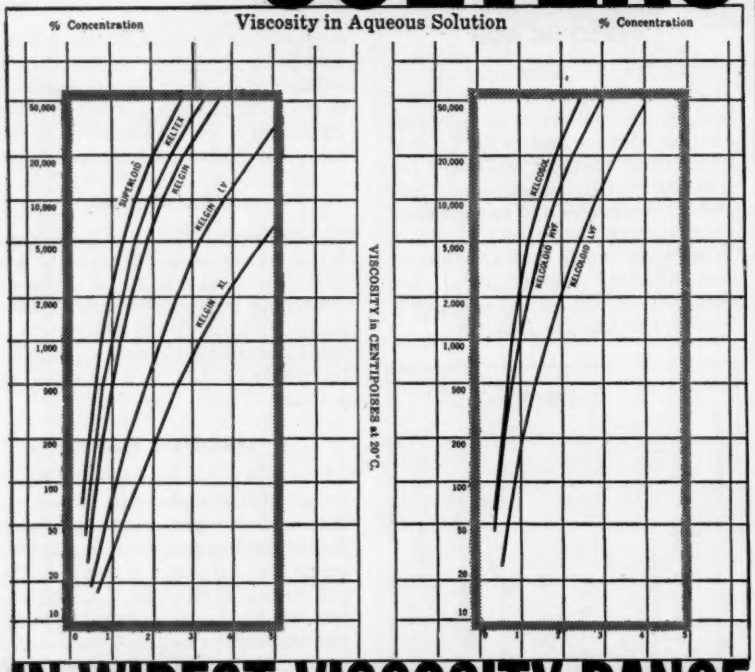
Formula	$H_2C_5H_4O_4$
Molecular Wgt.	130.10
Appearance	white crystalline powder
Melting Point	167-8°C
Solubility in Water	
At 20°C.	8.3 Gm./100 ml.
At 80°C.	72.5 Gm./100 ml.

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posed of a number of research teams, each headed by a coordinator. The system is flexible, teams may be organized in a variety of ways "so long as Ph.D.s don't do the work of a B.S., and a professional man is not a bottle-washer." Wherever possible, work that can be done by nontechnical people is assigned to the clerical staff. UOP researchers do not make their own mathematical calculations, for example.

Keeping in Touch: "In order to know what to do with a research department like this and direct it properly," explains Raaen, "you must have a program to send and receive information. The most important fact we communicate to our scientific people is the basic policy that we will investigate anything in the petroleum and related chemical fields, providing successful completion will contribute to the welfare of the company and those it serves.

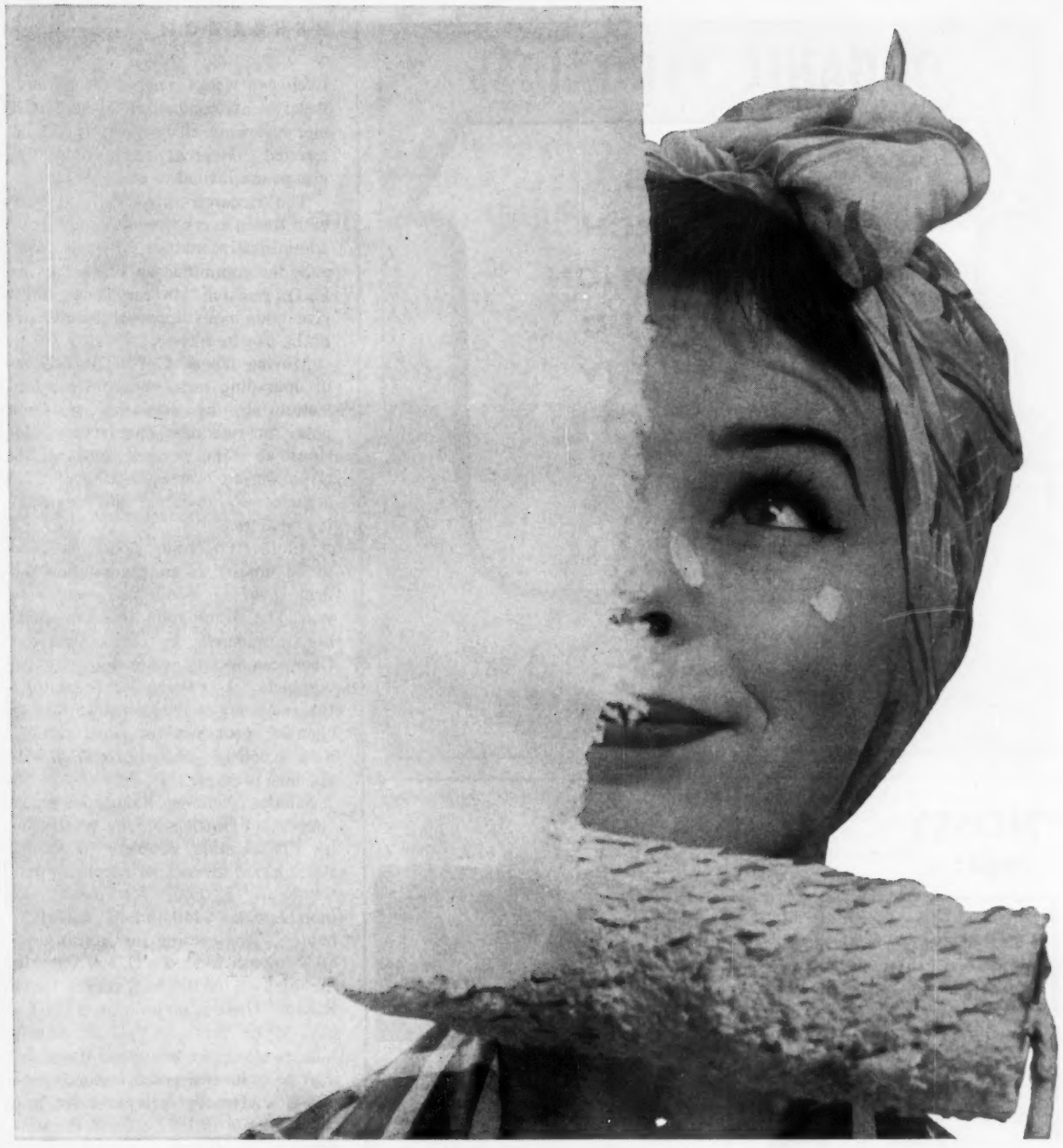
"I realize this may sound like a checkrein on creative research. Actually, it is not. For one thing, there is a wide area of research where a little more information will make a definite contribution to better petroleum refining. For another, it is not unusual for an applied research project to lead into pure research, to provide the extra bit of knowledge needed for success.

"We are quite willing to shoot for big stakes. But, we are not willing to fritter away money when there is no reasonable possibility that we'll gain anything significant."

Economic Values: "We try to keep our research people fully informed on the economic implications of their work," Raaen reports. "We keep their thinking directed toward production of processes that make better gasoline or petrochemicals at less cost. We try to keep them balancing the cost of their work against the value of the results. In short, they must stay within a budget and still produce results.

"Thorough two-way communication is required to make such a research philosophy work. Management must know what the researchers can accomplish and the research men must know what management requires."

Toward this end, each UOP research director meets weekly with his supervisors to review specific projects.



Look 'n' Roll

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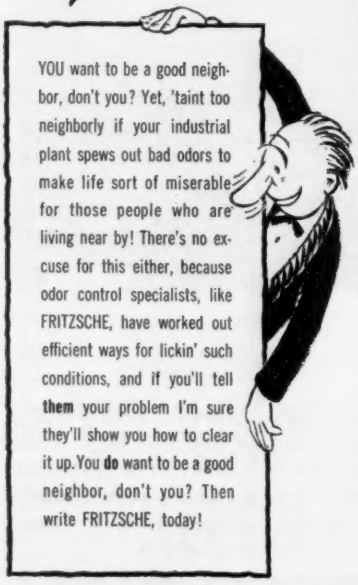
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RESEARCH

Each two weeks, one of the research departments conducts a lengthy meeting, reviewing all its projects. All interested research and engineering groups are invited to attend.

The research directors also meet with Raaen every two weeks to discuss administrative matters. They also comprise the committee on Ph.D.s, screen Ph.D. research job candidates, must give unanimous approval before any Ph.D. can be hired.

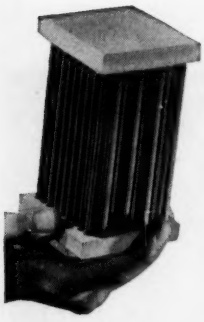
Moving Them Up: UOP believes in upgrading men, sponsors monthly lectures by an authority on some phase of research. The lectures, designed to stimulate their thinking, are given during business hours, may be attended by research and engineering staffers.

Another upgrading device, believed to be unique, is an examination the firm gives to nondegree men each year. The examination, based on questions prepared by the American Chemical Society, takes four days to complete. A passing grade entitles the examinee to the company title of chemist, puts him on equal footing with a college graduate, both in salary and prestige.

Salaries, believes Raaen, have an "important bearing on the productivity of scientific people." Minimum starting rate for inexperienced lab personnel is $2/hour for technicians (nondegree); $450/month for B.S. holders (engineering or chemistry); $650/month for a Ph.D. "We pay in the top 10% of the ACS curves," says Raaen. "There is no limit on a Ph.D.'s pay, if he produces." UOP adjusts salaries along the line when the starting rate of inexperienced research people is increased, feels that its low turnover rate (0.1%) reflects the wisdom of this attitude.

The firm encourages active participation in technical societies, sends out top people on field trips, even abroad. Raaen is convinced that these activities help in many ways in meeting the problems confronting a research organization.

Raaen thinks that a personal daily visit to the laboratories is a good idea, since such an indication of management interest also stimulates researchers to greater efforts. He's also aware that better methods of effective utilization of scientists are likely to be found. "We think it wise," he avers, "to research our research constantly."



An important message to the man who thinks his air pollution problem is too difficult—or too expensive—to correct

Too often an air pollution problem exists today for one reason only: The company concerned does not yet know there is now at hand an efficient, effective method of correcting it—often at an actual saving through waste heat recovery.

The method is catalytic oxidation, and the firm that makes this development possible is Oxy-Catalyst, Inc.

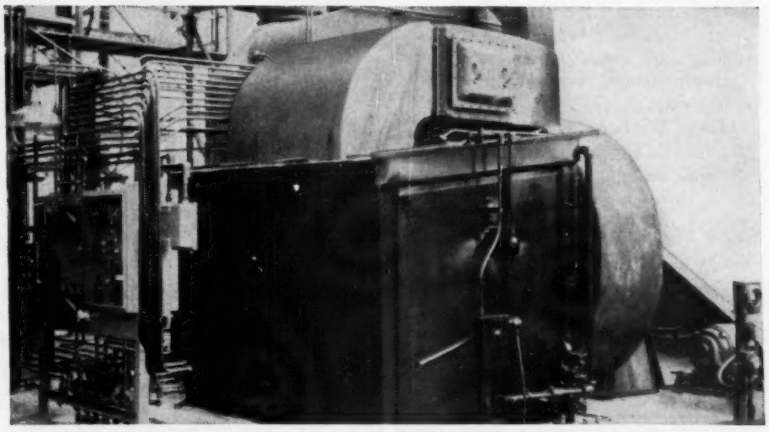
Catalytic oxidation works by "burning" harmful and irritating combustible contaminants in an exhaust stream at temperatures far below their normal ignition points. It provides close to 100% cleanup of foul-smelling fumes and odors. It reduces fire hazards and maintenance problems by eliminating troublesome condensates in oven and furnace exhausts.

Thus Oxy-Catalyst installations can not only control air pollution. They can also be used to release the latent heat energy in waste and process gases. And they can sometimes do both at once.

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The key to successful catalytic oxidation is, of course, the catalyst itself. Features which make the Oxycat unique are:

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- *The patented method of applying the catalyst to the carrier*
- *The patented mechanical design of the Oxycat itself*



Oxycat Installation on Standard Oil Company of California's phthalic anhydride unit at Richmond, Calif.

The result of this combination of features is a catalytic unit with exceptionally long life at high efficiency. Oxycats are strongly resistant to thermal shock—to contaminating agents and clogging. There's no problem of frequent cleaning or reprocessing. Oxy-Catalyst installations are still functioning at high initial efficiency after over 20,000 hours without maintenance or servicing.

Already in Wide Use

Oxy-Catalyst installations are now working effectively in a wide range of industries—oxidizing combustibles from such processes as asphalt oxidation; phthalic anhydride, polyethylene and ethylene oxide manufacturing; catalytic cracking; and many others.

Oxy-Catalyst installations are carefully engineered to your individual requirements, and our engineers, working with yours, can install Oxycats effectively in any existing plant. So, if air pollution is a problem in your operation—if irritating fumes and odors are costing you neighborhood good will—you should know that Oxy-Catalyst offers a practical, realistic answer to your problem.

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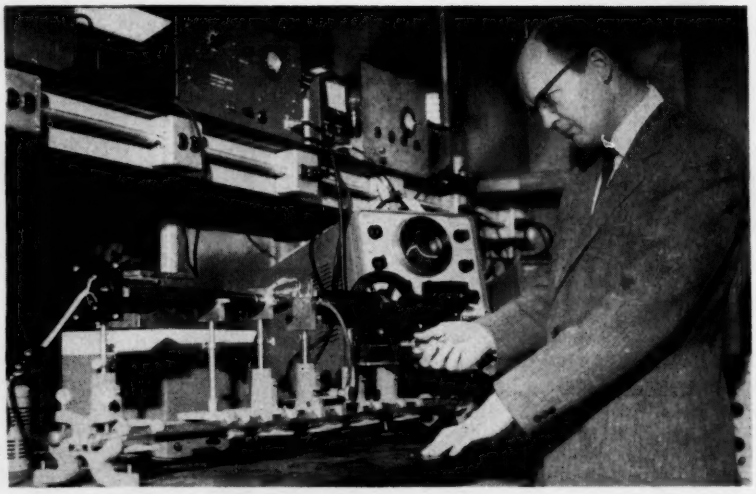
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Quick Check on Structure

Speedy identification of closely related molecular structures is the forte of a new electro-optic device developed by University of California's Chester O'Konski and co-workers.

O'Konski's system—based on production of optical birefringence* by transient electric fields—is potentially useful in the study of a host of macromolecular properties. The system has already been put to work in investigations of bentonite clay particle structure (for drilling muds) and radiation effects on viruses and nucleic acids.

Other likely areas in which the device will prove valuable:

- Polymer synthesis (for improving characteristics of preparatory solutions).
- Basic viscosity mechanisms (particularly in relation to polymers).
- Identification of biological molecules.
- Rotational diffusional constants (which give accurate and precise measurements of molecular size and shape).
- Electric dipole moments and polarizabilities.
- Polyelectrolyte characteristics (involving mainly the counter-ion atmosphere surrounding molecules in solution).

Basis of Birefringence: O'Konski's setup is based on the Kerr electro-optic effect—known as electric birefringence—which refers to electrically induced changes in the refractive index of a molecular solution. These changes are brought about by orientation of the molecules through interaction with the local electric field. The degree of orientation can be measured, which sheds a good deal of light on molecular structure, e.g., the identification of isomers.

The new technique goes the Kerr effect one step further. O'Konski found that a pulsed electric field enabled the apparatus to yield more information on basic molecular properties than does a steady field.

Until recently, O'Konski's apparatus limited the size of the molecules that could be studied to molecular weights in excess of 1 million.

Even so, O'Konski and his graduate students were able to investigate a wide range of macromolecules, including tobacco mosaic and related viruses; hemocyanin; desoxyribo-nucleic and related nucleic acids; gum arabic; synthetic polypeptides; vanadium pentoxide sols; and other inorganic polyelectrolytes.

Now, O'Konski is perfecting an improved setup that will handle compounds with molecular weights as low as 50,000. It will enable O'Konski to study ribonucleic acids; proteins, e. g., bovine serum albumin; and synthetic polymers such as polyglycols and adipates.

*Optical birefringence refers to double refraction of electromagnetic radiation from the ultraviolet through the infrared segment of the spectrum, inclusive.



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RESEARCH

Miami Highlights

Held under sunny Miami skies, last week's 131st National American Chemical Society meeting attracted some 7,000 visitors who heard 1,358 papers on a spate of chemical subjects. These industrially significant highlights turned up:

• Trimethoxyboroxine, a liquid, can be used to put out metal fires—a serious problem to processors and producers of magnesium, titanium, zirconium, etc. Made by Callery Chemical Co. (Callery, Pa.), the compound can be easily applied, even to vertical surfaces—an advantage over dry powders. Its combustion products are virtually nontoxic. The paper was presented by J. D. Commerford, of Anheuser-Busch (St. Louis), coauthored by Stanford Research Institute's (Menlo Park, Calif.) D. L. Chamberlain, Jr., and Callery Chemical Co.'s J. W. Shepherd.

• A new pain-killing drug family—thiazolins—developed by Ciba Pharmaceutical Products (Summit, N. J.), are reportedly fast-acting and long-lasting. Ciba's George DeStevens, Heino Luts and Jurg Schneider reported on them.

• Duramycin, a stable polypeptide antibiotic isolated from culture broths of *streptomyces cinnamomeus forma azacoluta,* may be useful against a variety of crop diseases. Odette Shotwell of USDA's Northern Utilization Research Branch (Peoria, Ill.) reported that Duramycin (so called because of its stability to heat) comes from an antibiotic mixture that's effective against several crop maladies.

• New silicone compounds that show potential as intermediates in the preparation of dyes, textile finishing agents, organic silicone copolymers, were unveiled by D. L. Bailey and R. M. Pike, of Union Carbide and Carbon Corp.'s Silicones Division. The newcomers: silicone triazine derivatives synthesized by reaction of organofunctional aminoalkyl silanes and aminoalkyl silicones with chlorine-substituted triazines.

• Improved durability and weathering in unsaturated polyester styrene resins can be achieved by replacing part of the styrene with methyl methacrylate. The find could lead to wider use of the resins as building materials, according to spokesmen Arthur Smith and J. R. Lowry of Rohm & Haas Co.

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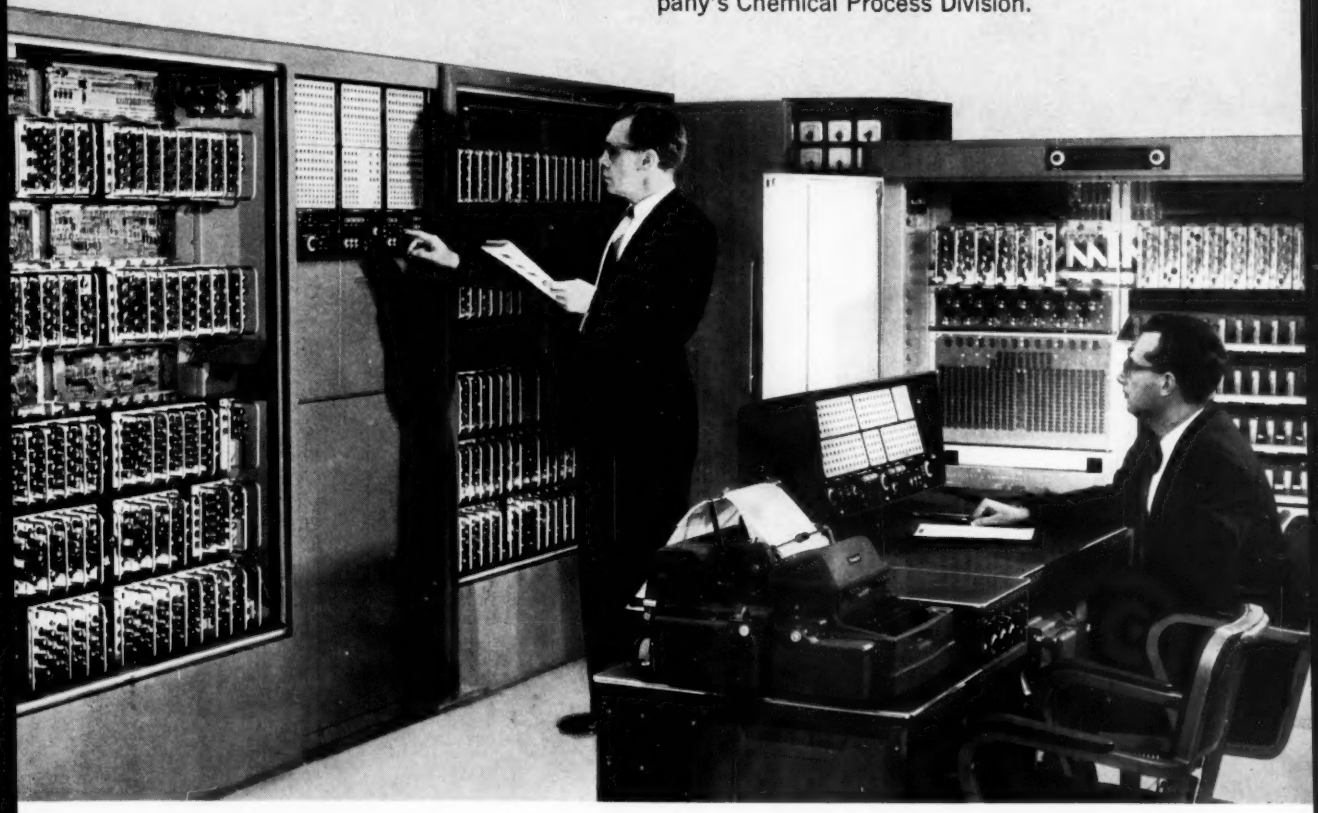
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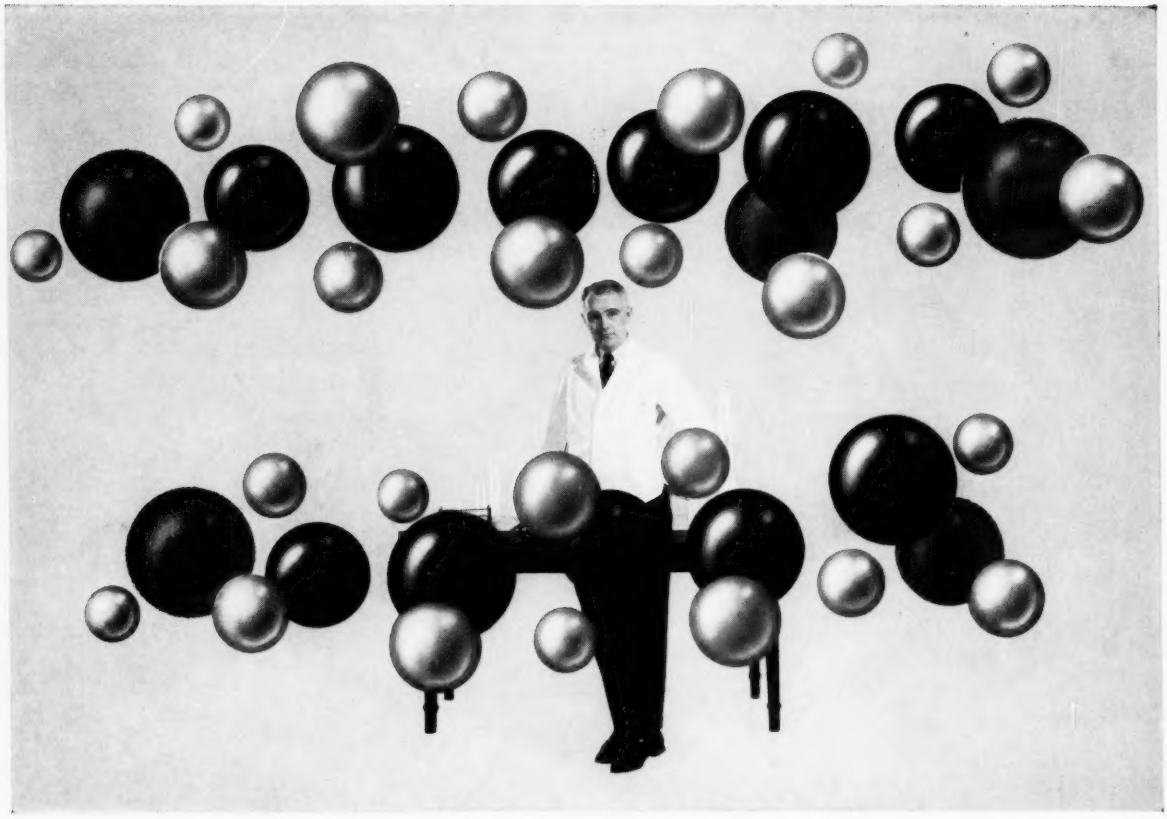
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